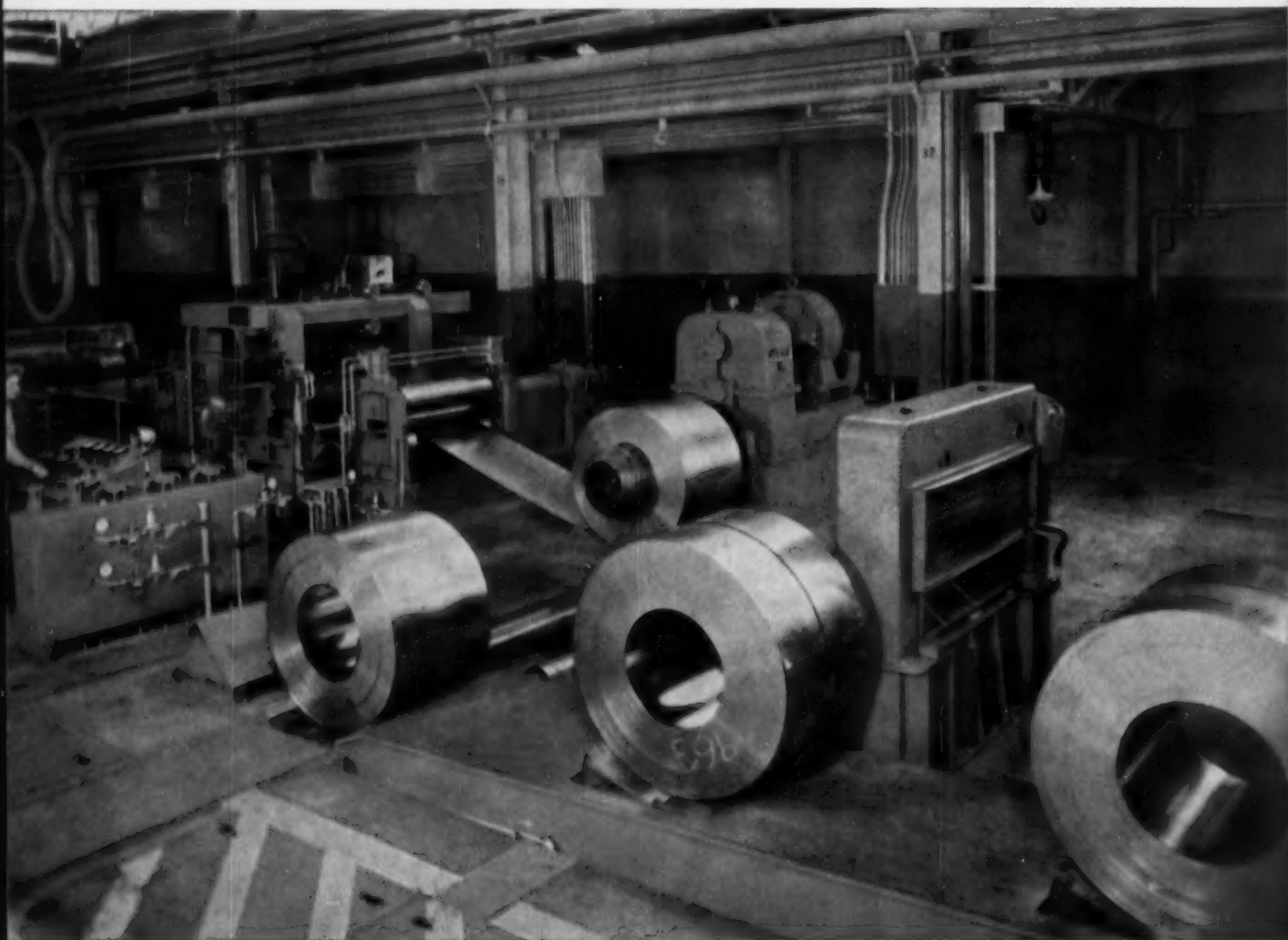


The **Iron Age** A Chilton Publication

**St. Lawrence
Seaway:
Industry's new
frontier**
See page 59

THE NATIONAL METALWORKING WEEKLY • OCTOBER 13, 1955



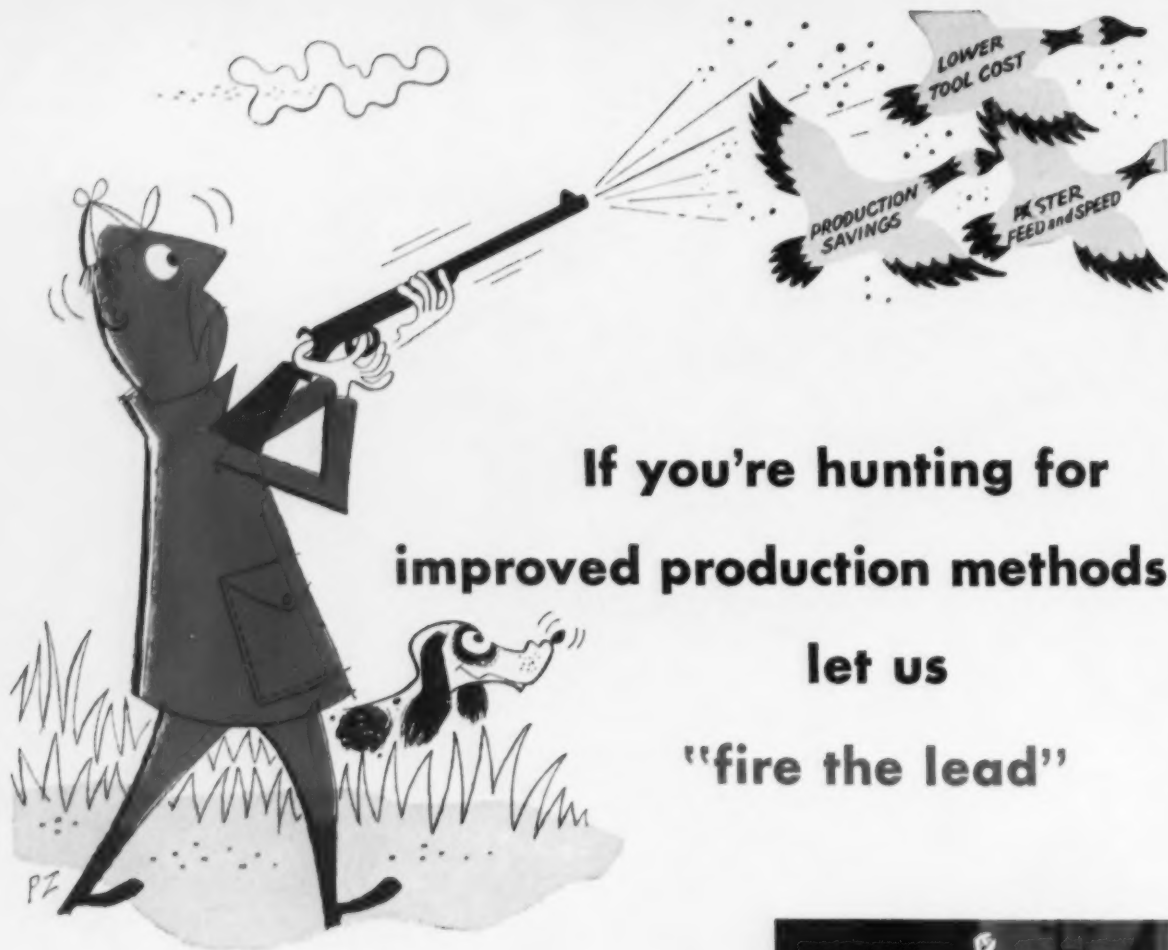
Coil Entry Section — Wean Galvanizing Line



WEAN
ENGINEERING
COMPANY • INC.
Warren, Ohio

Typical of Wean Advanced Engineering is this continuous hot dip galvanizing line that produces a vastly improved zinc coat steel at greatly increased speeds. Heavier coatings, tighter bonding and greater uniformity are now possible at reduced costs. It's this kind of never ending search for better ways of making better steel products that has established Wean as the nation's foremost designer and builder of sheet, tin and strip mill equipment.

SPECIALISTS IN SHEET, STRIP AND TIN MILL EQUIPMENT

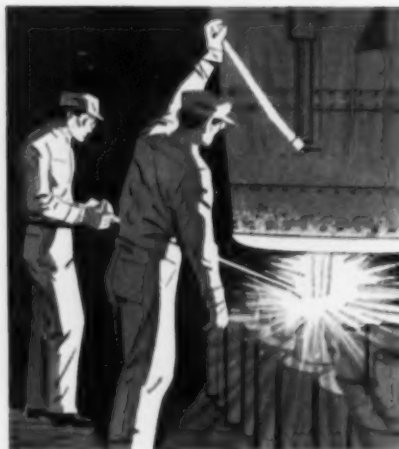


**If you're hunting for
improved production methods
let us
"fire the lead"**

Carbon and alloy steels that have been lead treated by Copperweld retain their basic characteristics and mechanical properties. Yet they do supply alert industrial management this ammunition in their hunt for more profitable production:



- Faster feeds and speeds
- Longer tool life
- A finer finish which may eliminate a finishing operation



When an ingot is being teemed, fine shot pellets of pure lead are scientifically "fired" into the molten metal.

COPPERWELD STEEL COMPANY
STEEL DIVISION • WARREN, OHIO

EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY, 117 Liberty St., New York 6, N. Y.



Smooth sailing for Junior on springs of Steel

It's plain to see that Junior is tickled pink with his brand new stroller. Sleek and smartly styled, it glides along smoothly on bump-absorbing steel springs.

These baby-stroller springs are made from narrow strips of carbon spring steel which are heated to the required temperature, formed into shape, then air-cooled. The result: mighty smooth sailing for the small fry.

Leading manufacturers of baby strollers and carriages use substantial tonnages of Bethlehem carbon spring steel, as well as other Bethlehem hot-rolled carbon-steel bar products, for axles, foot pedals, brakes, shackles and miscellaneous parts.

The combined requirements of many active and growing industries have created an unprecedented peacetime demand for hot-rolled carbon-steel bars. We're doing our best to meet this demand, all the while maintaining the quality standards that our customers expect of products bearing the Bethlehem name.



Bethlehem's merchant mills at Lackawanna, N. Y., and Johnstown, Pa., produce hot-rolled bars for a wide range of industries.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



Starred items are digested at the right

EDITORIAL

How About Steel Expansion? 7

NEWS OF INDUSTRY

*Special Report: St. Lawrence Seaway Story 59
 *Government: Consumer Credit and Politics 63
 *Management: The Facts on Industrial Medicine 64
 *Defense: Carrier Saratoga Hits the Ways 65
 *Interview: Long Range Look at Metals 66
 *Marketing: Stainless Holds Big Auto Market .. 67
 *International: England Loses Out in India 68
 Personnel: Iron Age Salutes 89
 Iron Age Introduces 91

NEWS ANALYSIS

Newsfront 57
 Report to Management 73
 Automotive Assembly Line 76
 *This Week in Washington 83
 West Coast Report 85
 *Machine Tool High Spots 87

TECHNICAL ARTICLES

*Process Deposits Ductile Chrome Coat 99
 *Simplify Sectional Dies For Savings 102
 Prolong Furnace-Retort Service Life 105
 *New Ideas Increase Steel Capacity 106
 *High-Temperature Stainless Steels, Part II 109
 *Turret Lathes Are Easily Adaptable 112
 New Machining Setup Boosts Output 114
 Technical Briefs 124

MARKETS & PRICES

*The Iron Age Summary—Steel Outlook 155
 Steel Product Markets 156
 Comparison of Prices 157
 Iron and Steel Scrap Markets 158
 Nonferrous Market 162
 Steel Prices 164

REGULAR DEPARTMENTS

Dear Editor 9
 Fatigue Cracks 11
 Dates to Remember 13
 Free Literature 116
 New Equipment 145

INDEX OF ADVERTISERS 185

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NEWS DEVELOPMENTS

GREAT LAKES AREA GETS READY FOR SEAWAY—P. 59
 Opening of St. Lawrence Seaway and construction of new power projects open up new areas for industry, new ports for world trade. Cities on Great Lakes are in varying stages of planning for new role. Chicago approves and sells bond issue for new harbor. Cleveland still has to vote funds. Massena area in New York will benefit from new power, seeks to attract new industries. Small cities make big plans.

WASHINGTON EYES CREDIT-HAPPY CONSUMERS—P. 63
 Total consumer credit jumped \$740 million in August to a record high of \$33.636 billion. This does not include mortgage loans, which total more than \$80 billion. With Presidential elections coming up, both parties are watching the situation with more than usual interest. Authorities differ on the effects of expanded credit. Some say consumers will be pinched in future months as bills come due. Others reject this idea, say economy is healthy and strong.

MEDICAL: IS YOUR SETUP ADEQUATE? — P. 64
 Pressure from unions, advice from insurance companies, as well as the sheer economics of maintaining full scale production make the problem of industrial medicine a pressing one. A group of doctors, sponsored by the Industrial Medical Assn., stands ready to study your problem and recommend the best solution.

FLAT TOP: \$200 MILLION FOR SEA DEFENSE — P. 65
 The sixth U. S. Navy ship to bear the name Saratoga is, as far as can be determined, equal in cost to the total of the other five. But the new, first-of-kind equipment she carries makes the Saratoga the most formidable warship ever built. Her propulsion equipment will develop over 200,000 horsepower, more than any other ship ever built, but is compact unit.

BOOM, POLITICS MAKE TAX CUTS CERTAIN — P. 83
 Fat U. S. tax revenues and the approach of elections make income tax slices sure. Both parties will push for sponsorship of tax relief measures. Biggest reductions will be in lower income brackets—\$6000 and down. Business will have to wait for any drop in levies but will profit from consumer gains.

ENGINEERING & PRODUCTION

PROCESS DEPOSITS DUCTILE CHROME COAT — P. 99

Heavy, dense hard-chromium deposits can be plated directly on aluminum by a new process which gives exceptional intermetallic bonding strength. Deposits are highly ductile, provide high resistance to distortive bending, torsional and impact loading. Applications include titanium sheet, cold-rolled steel, zinc alloys, lead alloys, beryllium-copper, tungsten carbide.

SIMPLIFY SECTIONAL DIES FOR SAVINGS — P. 102

One-piece dies are often difficult to machine from a solid block of steel, usually require much hand filing and fitting. Use of sectional dies can frequently solve these problems. But proper design is important for accuracy, long life, easy maintenance. Here's helpful information on composite die design, construction, use.

NEW IDEAS INCREASE STEEL CAPACITY — P. 106

Capacity to meet customers' ever-increasing demands is steel's most pressing problem. Cost estimates for new construction and replacement of existing equipment call for almost \$2 billion per year. Fortunately, as the recent AISE Meeting brought out, plant ingenuity and new processes offer alternatives. One process might up openhearth output by 50 pct.

HIGH-TEMPERATURE STAINLESS STEELS, PART II—P. 109

Recent research on stainless steels has been aimed at development of nickel-free grades. One such steel, Crucible CMN, has high resistance under stress at high temperatures, good oxidation resistance up to 2100° F. In rider sheet applications, it can replace type 310, and it is stronger than type 446 for this purpose.

TURRET LATHES ARE EASILY ADAPTABLE — P. 112

Modern turret lathes are adaptable to many ingenious setups. For small shops, this means ability to handle a multiplicity of jobs with a minimum of equipment. Larger shops sometimes realize savings too. Here's how one company tooled three such lathes for special work.

MARKETS & PRICES

WHAT'S OUTLOOK FOR METALS IN 1980? — P. 66

Republic Steel Corp. official takes a look into the future of steel and other metals. He foresees smaller economic steel units tailored to fit specific needs. Future of titanium expected to lie largely in engineering and technical products. Outlook for powder metallurgy discussed. Geographical shift will be slow.

AUTOMOTIVE IS STAINLESS' BEST CUSTOMER — P. 67

No. 1 industry customer for stainless steel is automotive. This market has doubled in size since 1948 and stainless producers have had a tough time keeping up with this and other industry demand. Stainless shipments to automotive this year likely will establish an all-time record of 135,000 tons.

BRITISH UNDERBID ON INDIAN CONTRACT — P. 68

The smaller countries of Europe used economics to counteract old empire ties to shut out British firms in the bidding to supply India with 431 locomotives. Offers trimmed lowest British bids by 6 to 16 pct.

BRITISH TOOLMAKERS QUIZ U. S. BUYERS — P. 87

A representative of England's machine tool industry asks why that country sells so few machines here. UK builders are anxious to correct an unfavorable trade balance. Answers centered on the lightness of British machines and the fear of service delays. British say they have some lines that offer sufficient ruggedness for the medium-sized shop. They point to a long record of satisfactory service relations with India.

ARE STEEL PRODUCT PRICES ADEQUATE? — P. 155

Comments of some steel producers over the high cost of installing new steel capacity raise the question of whether steel prices are adequate. It's possible that with expansion costing over \$300 per ton, higher prices may be justified to insure adequate expansion when needed. Some steel consumers say privately higher prices may be the answer.

NEXT WEEK:

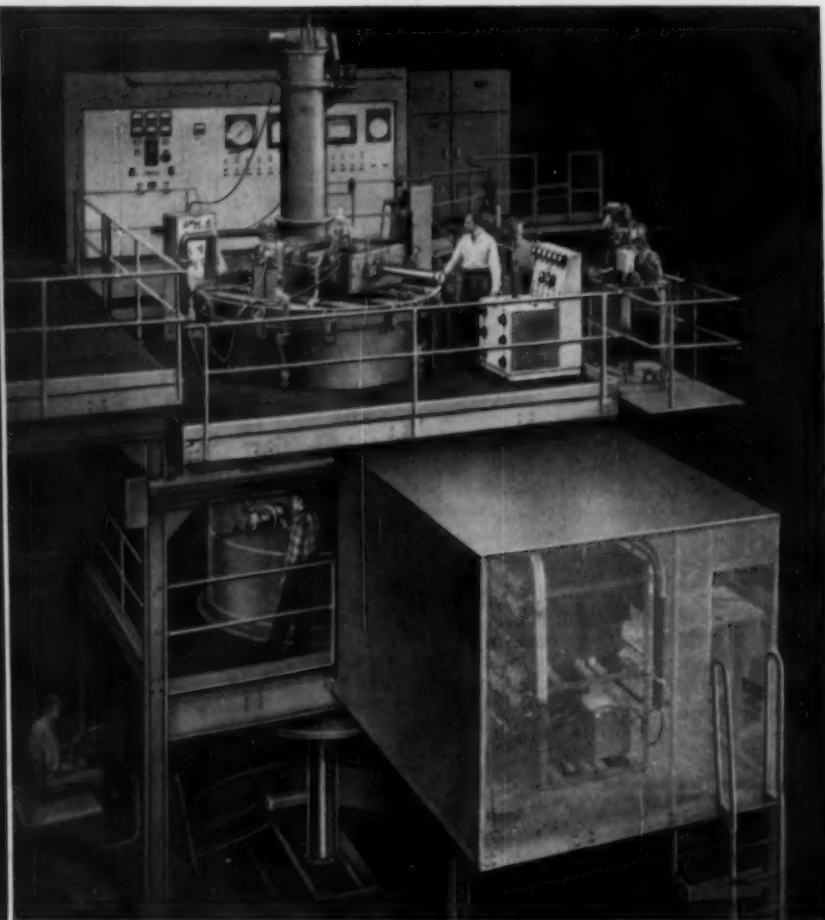
HEAT TREAT CONTROLS BOOST JOB SHOP QUALITY

If you're looking for a better, more efficient way to control your heat treat operations, you'll be interested in the system used by Bosworth Steel Treating Co. A broad range of work is handled but the "system" keeps production and quality at high levels. Control steps to better quality are described in this article.

WILL '56 BE ANOTHER GOOD YEAR FOR INDUSTRY?

Next week's special report tells how 1956 is shaping up for major industries. Appliance, automotive, defense and other fields are covered. Report gives a detailed breakdown of prospects and an overall picture of the future. It tells what's going to happen, gives facts and figures behind predictions.

*what
made
vacuum
melting
work?*



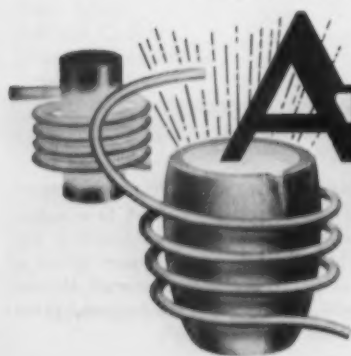
*The first 1000-lb. vacuum furnace to be put into production.
Photo courtesy Universal-Cyclops Steel Corp., Bridgeville, Pa.*

primarily—newly discovered vacuum techniques applied to forty years of induction furnace manufacturing experience. And only at Ajax does this experience cover so many melting developments over such a long period of time. Successful vacuum melting, as it comes from Ajax today, is just

another refinement in Ajax quality melting at production speed.

The vacuum furnace illustrated above is typical of a number which are now being built for purer, stronger alloys in capacities from 5 to 2000 lbs. For details, write Ajax Electrothermic Corp., Trenton 5, New Jersey.

Associated Companies: Ajax Electric Company—Ajax Electric Furnace Co.—Ajax Engineering Corp.

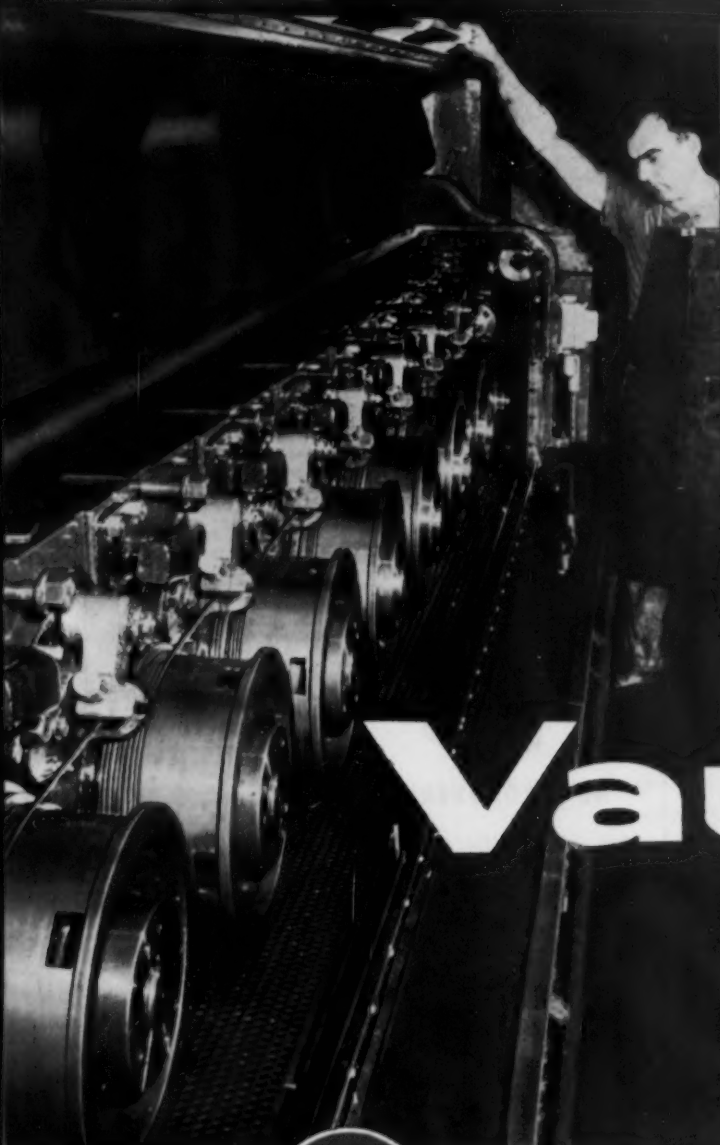


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"Quick on the Draw!"

The VAUGHN MACHINERY COMPANY

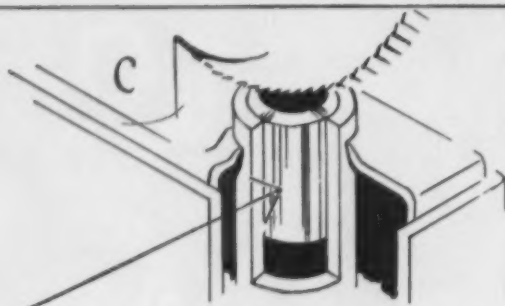
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HOW ARMCO 17-7 PH STAINLESS STEEL keeps this lighter in shape

A tiny hardened Armco 17-7 PH Stainless Steel bushing is the key to dependability and long service life of a well-known lighter.



WHAT THE STAINLESS BUSHING DOES

This collar in the top of the tube keeps the flint in alignment and prevents jamming. The collar must be perfectly formed and very hard. That's why it's made of Armco 17-7 PH Stainless Steel, precipitation hardened.



PREVENTS THIS

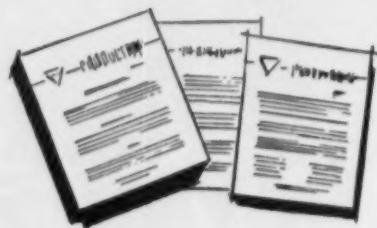
NO "FLOPOVER" FLINTS

In an ordinary flint tube, repeated pressure of the spark wheel against the flint causes the end of the tube to expand. This permits the flint to "flop over," making the lighter useless.



WHAT THIS STEEL OFFERS YOU

Consider the advantages of Armco 17-7 PH Stainless Steel for your products. It can be drawn and formed in the annealed condition to close tolerances. Then, it can be hardened at low temperatures to tensile strengths of around 200,000 psi. It is "transformed" by holding at 1400 F for 1½ hours and cooling to 60 F or below. Hardening is completed by heating to 950-1050 F, holding for ½ to 1½ hours and cooling.



GET COMPLETE DATA

Armco 17-7 PH is produced in sheets, strip, plates, bars and wire. Besides, there is a single heat treatment precipitation-hardening stainless steel, Armco 17-4 PH, made in bars, wire and billets only. For complete information on these special Armco Stainless Steels, just fill out the coupon and mail it to us.



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and the Engineering Index.



Editorial:

How About Steel Expansion?

♦ **CURRENTLY** there is a substantial shortage of steel ingots. This may be temporary but it is the real thing to steel customers. Part of this shortage may become more than temporary if the steel expansion program does not pick up steam.

Elimination of rapid amortization for steel was a blow to some steel firms. They had counted heavily on it in their expansion plans. It is unlikely that the government will revive the fast write-off plan for steel soon—if at all.

Many steel firms are now adding to their steelmaking facilities. Others plan to do so. To date the steel expansion program seems to lack a spirit of urgency. Maybe that will come later in the year or early next year.

That we need more capacity is the most agreed upon foregone conclusion ever to permeate the steel industry and its customers. Major steel leaders have time and again publicly confirmed what many have known for quite a while—the country needs an additional 3 million ingot tons per year for some time to come.

Steel customers are sensitive to periodic steel shortages. Publicly they don't have much to say, for obvious reasons. Privately they are disturbed about it. They resent being told by some steel people that they were asleep at the switch last fall when steel was easier to get.

The steel capacity problem is deeper and more sensitive than appears on the surface. Unless the long term program gets off the ground with more speed and less talk, there may be repercussions. It is within the realm of possibility that the present Administration could become involved in the picture in a manner similar to its predecessor.

But where will the industry get the money to furnish 3 million tons of additional steel capacity each year for the next 10 to 15 years? The amortization law might be revised in a year or so to take care of rapid write-offs for all industries. That could be in the form of general legislation. But it will take time.

Chances are the funds for expansion will come from depreciation balances, higher steel prices, and public borrowing. The longer it takes to get things started in a big way the more often the country will be faced with these temporary steel shortages and the more sensitive will become the customer—and the government.

Tom Campbell

EDITOR-IN-CHIEF

EVOLUTION of MULT-AU-MATIC PROGRESS

Since 1914 the Bullard Mult-Au-Matic has reflected engineering and design progress required to fulfill industry's needs — until today, the Type "L", is the optimum for machines of its type.

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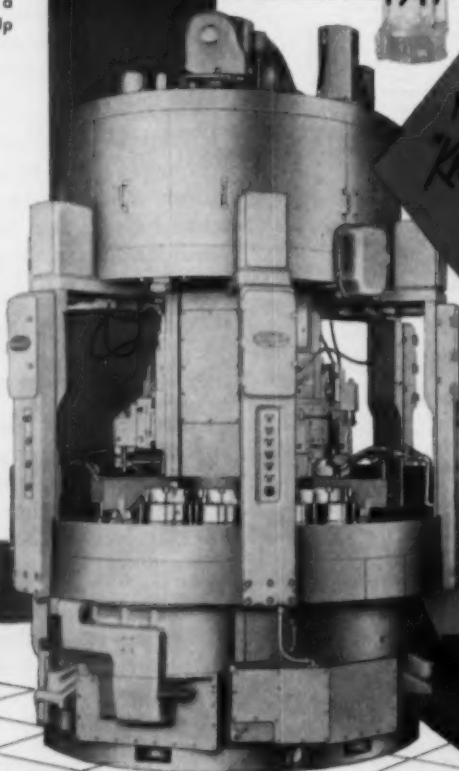
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1919

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dear editor:

letters from readers

Copper

Sir:

We have noted with interest your article entitled "Copper: Report on a Tinder Box" which appeared in your September 15th issue.

This article covers the copper situation so well that we are anxious to obtain 100 reprints and would appreciate your cooperation in making these available to us. *H. D. Runey, Sales Manager, Brady Supply Corp., 255-259 State St., Elmira, N. Y.*

Sorry, no reprints of this article are available but limited reproduction, with credit, is permissible.—Ed.

Chrome Plating Process

Sir:

On the "Newsfront" page of your August 25th issue you carried an item about a new chromium plating process. We will appreciate any information you can send us on this process. *C. B. Haynes, Works Metallurgist, International Harvester Co., Industrial Power Div., Melrose Park Works, Melrose Park, Ill.*

Further information about the new chromium plating process may be obtained from *P. J. Topelian, Vice President, Traico Corp., Clark, N. J.* A technical article on this development appears in this issue.—Ed.

Lubricant Additives

Sir:

May we take this belated opportunity to thank you for publishing the feature story on lubricant additives used at the Security Engineering Division of Dresser Operations, Inc.

You will be interested to know that we have received nearly 250 inquiries—by telephone, wire and letter—to this date, and each mail brings more.

Needless to say, the value of your article would be difficult to establish. In any event, we here are most

cognizant of the benefits derived from this article and again, we wish to extend our most sincere thanks to you and all of your personnel concerned in preparing and publishing this most comprehensive article. *Arthur Van Wyke, Ass't to President, The Iso Mite Corp., 4470 E. Washington Blvd., Los Angeles 23, Calif.*

Molybdenum Wire

Sir:

We would appreciate receiving any additional information which may be available on the molybdenum item mentioned in the July 28th "Newsfront" item "Cobalt Improves Electrical Wire." *J. H. Clark, Materials Engineer, Micro Switch, Div. of Minneapolis-Honeywell Regulator Co., Freeport, Ill.*

More details may be obtained from *Fansteel Metallurgical Corp., North Chicago, Ill.*—Ed.

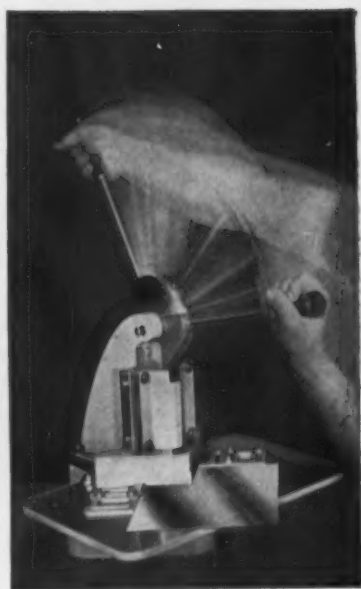
"100 Years"

Sir:

I have already spent quite a bit of time with this new edition and was fascinated with its contents. It is a book which I plan to spend more time with in the future. *W. P. Gibbons, Advertising Manager, Industrial Products, Johns-Manville Sales Corp., 22 E. 40th St., New York.*

A preliminary survey of the copy has made me feel that I will want to spend considerable time with it. *R. E. Brightup, Advertising Manager, Greenlee Bros. & Co., Rockford, Ill.*

It is an excellent reference book, as well as an interesting and educational presentation. *Bert Inch, Vice President, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif.*



Notching Sheet Materials?

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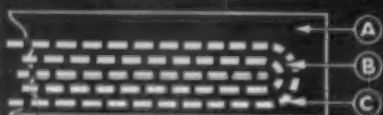
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high-temperature service



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- B. Skim coat provides maximum flex-life.
- C. Multi-ply of strong fabric for high load-carrying capacity.

Conveyor life doubled *hauling 230° F. silica sand*

HOT PROBLEM for a silica sand processor was short conveyor life. Belts carrying 230° F. sand were cracking, wearing, pulling apart because of high heat and abrasive dust. Two makes of belts were tried but each failed after one year's service.

Looking for an answer to their problem, the company asked the advice of the G.T.M.—Goodyear Technical Man. He recommended a Style 6740 belt with the specially compounded rubber cover that would not harden or crack under the baking heat, would resist the effects of abrasive dust.

RESULT: The Goodyear conveyor is still in service after two years—shows no sign of wearing or

failing. And savings of 30 man-hours of maintenance, to date, have gone a long way towards paying for the belt.

Bulk materials of almost any kind can be carried almost anywhere—at less cost—by Goodyear conveyors. For help in your materials-handling problems call in the G.T.M. Contact him through your Goodyear Distributor or by writing Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the Yellow Pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."

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GOOD YEAR

THE GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

fatigue cracks

Do It Yourself Week

This is our week to be lazy. We're beaten. We're tired, frustrated, bewildered. We're bedevilled from all angles. We're in the midst of our move to Philadelphia. We're not going to write a thing. We're going to turn to our file marked "news-paper oddities" and just throw them in here any old way. We have not altered these stories in any way. We don't have the strength.

* * *

Catalina Isle Skipper On Last Voyage

Los Angeles—A man who has hauled an estimated six million passengers 390,000 miles to and from nearby Santa Catalina Island makes his last voyage today. Lee Mussetter, 8, is retiring as master of the steamship Catalina that carries vacationers to the world-famed resort.

Fill in your own remark here...

* * *

Hunt Wasp Ensign And Missing \$70,000

San Francisco — The carrier Wasp, in drydock here, is short about \$70,000 in ship funds and its 13-year-old disbursing officer, Ensign David J. Page, of Croton Falls, N. Y., went on an authorized weekend liberty Friday but failed to return to duty Monday, the Navy said.

Fill in your own remark here (might as well make the same as above)

* * *

Stick to Truth In Sex Training

Question—"We have a baby girl three months old. We would like your views on teaching a child early enough about sex so she will have a proper attitude toward it.

by William M. Coffey

I don't want her to think it's cruel or nasty, and yet I don't want her to be too interested."—Mrs. A. B.

Fill in your own remark here...

Puzzlers

Fight this one out among yourselves. As we said, we've had it and solving puzzlers is just not on the program this week. We received four answers to Wallace Sawdy's puzzler (Sept. 29 issue), all of them different. Wallace says that X equals 81 and Y equals 1243; C. W. McKinley (and we don't think C. W. has been wrong yet) says X is 100.6560434 and Y is 1100.6560434; that Gen'l Steel Bunch (Charlsie's Club) says X equals 99.398 and Y equals 1298.194 (if this is wrong don't blame Charlsie. She is on vacation safari); George W. Frederick, Republic Steel Corp., says X equals 50.17 and Y equals 1150.51. And Fred P. Boulais, Acme Steel Co., says X equals 99.398 and Y equals 1298.194. How about this, Wallace?

New Puzzler

Mr. J. J. Bosshard sends us this one. If a two-digit number "A" is placed to the left of another two-digit number "B" consisting of the same digits and the whole number divided by the number "B" the result is nine divided by number "B" plus 53. If, however, the number "A" is placed to the right of "B" and the whole divided by "A," the result is 176. What are the A and B numbers? Thank you, Mr. Bosshard.

3 important reasons
you should use
STAR "Moly"
High Speed Steel Blades



1 They outlast standard steel blades 10 to 1!

2 They assure high speed cutting performance second to none.

3 They are substantially lower in cost than any other type high speed steel blades!

Star was the first to successfully use molybdenum to make "Moly"® High Speed Steel Blades that would be tough, carry the load, retain sharpness and embody all the other high qualities and properties of heavy-duty blades. Order "Moly" High Speed Steel Blades from your Industrial Distributor. Rely on him for all your metal-cutting needs. Remember, he carries the complete line of STAR Hand and Power Hacksaws, Metal and Wood Cutting Band Saws and Hacksaw Frames.

FREE

Ask your Industrial Distributor for a supply of our NEW Metal Cutting Booklets and Wall Charts.

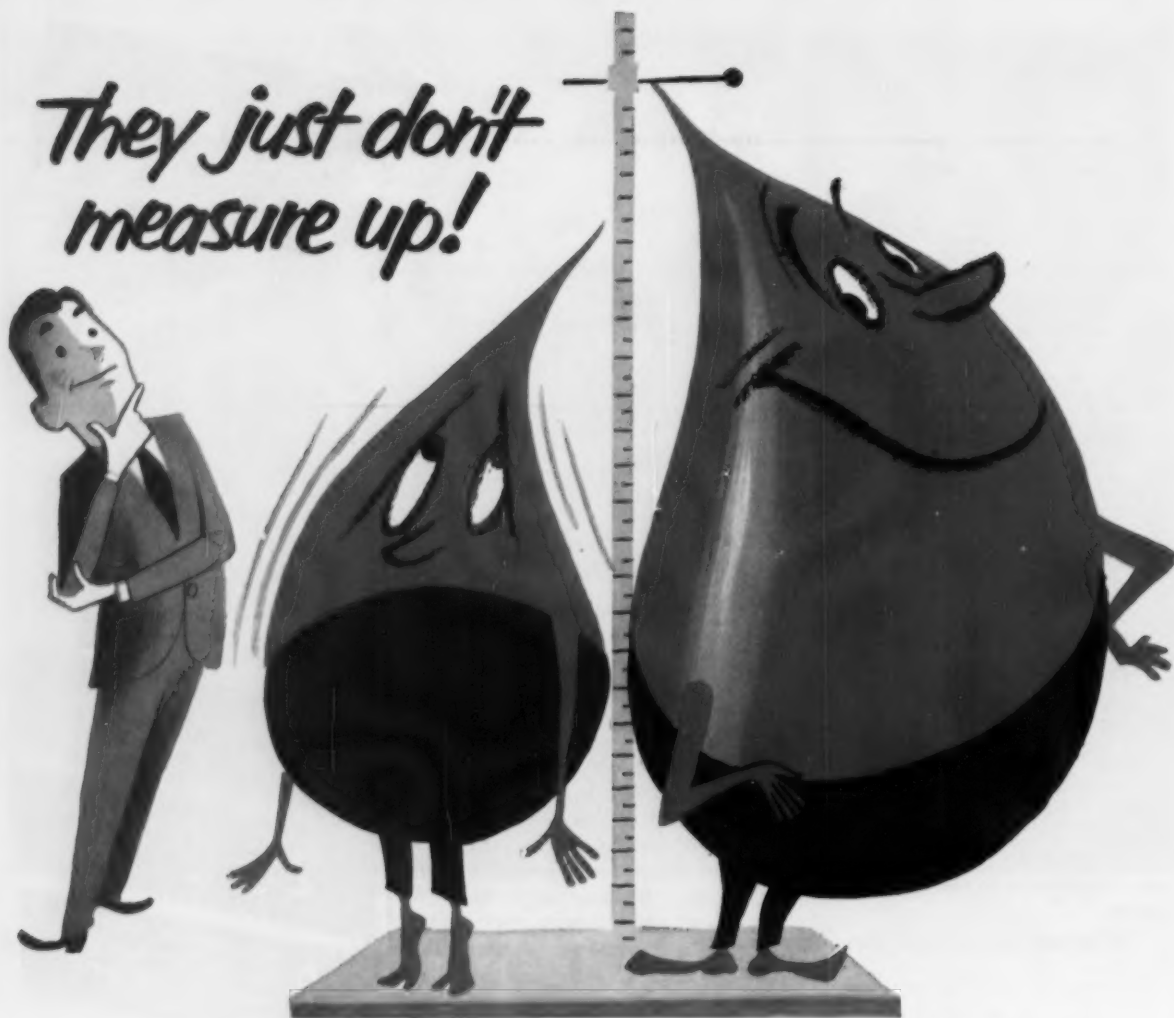
Sold Only Through
Recognized Distributors

CLEMSON

CLEMSON BROS., Inc.
MIDDLETOWN, N. Y., U. S. A.

Makers of Hand and Power Hacksaw Blades, Frames, Metal and Wood Cutting Band Saw Blades and Clemson Lawn Mowers.

*They just don't
measure up!*



When you're offered oils "just as good" as Gargoyle D.T.E., remember these facts...

Have you ever wondered why, so very often, you're urged to buy an oil that's "just as good as Gargoyle D.T.E."? The reason is simple... Industry has always accepted Gargoyle D.T.E. hydraulic oils as the *standard of quality* in this field!

These substitutes may have *some* of Gargoyle D.T.E.'s properties—but *none* measures up in all-round performance! Gargoyle D.T.E. hydraulic oils last longer—have given excellent service, in many cases, for thousands of hours! They boost machine efficiency—improve production and quality—help reduce manufacturing costs. That's why—although Gargoyle D.T.E. costs a trifle more (often as little as *one mill* per machine per hour) they actually save you money in the long run!

And here's an *extra* plus... the world's greatest lubrication engineering service goes with these famous oils—at *no extra cost*! So why settle for less than the best? Call us today!



Socony. Mobil
Correct Lubrication
FIRST STEP IN CUTTING COSTS

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION
Formerly Socony-Vacuum Oil Company, Inc.

dates to remember

OCTOBER

METAL TREATING INSTITUTE—Annual meeting, October 14-16, Warwick Hotel, Philadelphia. Institute headquarters are at 271 North Ave., New Rochelle, N. Y.

CONVEYOR EQUIPMENT MANUFACTURERS ASSN.—Annual meeting, Oct. 15-18, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, No. 1 Thomas Circle, Washington, D. C.

EXPOSITIONS

1955

NATIONAL METAL CONGRESS AND EXPOSITION—Oct. 17-21, Philadelphia.

1956

ASTE—Industrial exposition, March 19-23, Chicago.

MATERIALS HANDLING SHOW, June 5-8, Cleveland.

AMERICAN GAS ASSN.—Annual convention, Oct. 17-19, Los Angeles. Association headquarters, 420 Lexington Ave., New York.

AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS—Annual fall meeting, Institute Metals Div., Oct. 17-19, Adelphia Hotel, Philadelphia. Institute headquarters, 29 W. 39th St., New York.

AMERICAN WELDING SOCIETY—National fall meeting, Oct. 17-21, Philadelphia. Society headquarters, 33 W. 39th St., New York.

THE GRAY IRON FOUNDERS' SOCIETY—27th Annual meeting, Oct. 19-21, Schroeder Hotel, Milwaukee. Institute headquarters, 930 National City-East Sixth Bldg., Cleveland 14.

AMERICAN GEAR MANUFACTURERS ASSN.—Semi-annual meeting, Edgewater Beach Hotel, Oct. 23-26, Chicago. Institute headquarters, No. 1 Thomas Circle, Washington 5, D. C.

RAIL STEEL BAR ASSOCIATION—74th meeting, Oct. 24-25, Sherman Hotel, Chicago. Association headquarters, 38 South Dearborn St., Chicago.

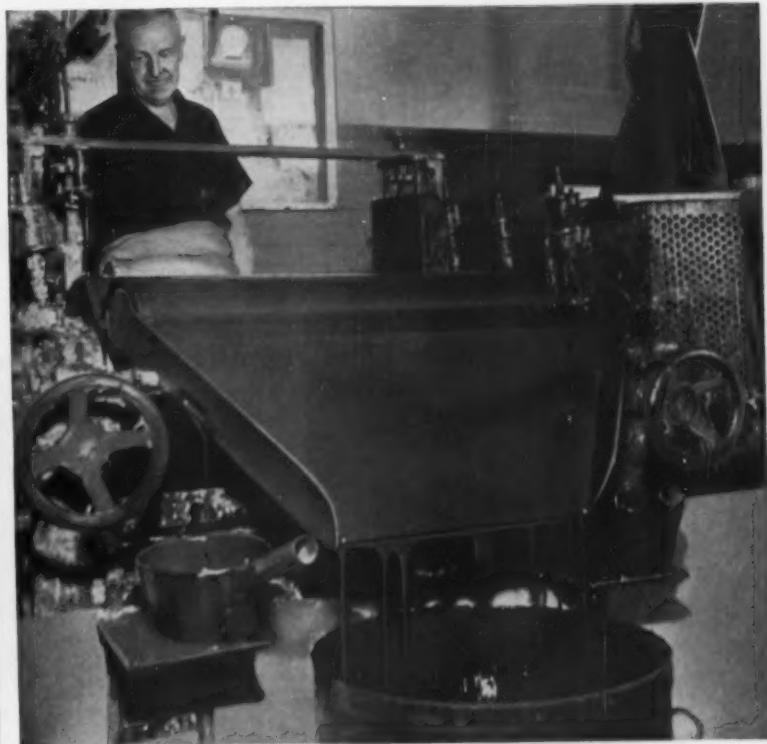
STEEL FOUNDERS' SOCIETY OF AMERICA—Annual fall meeting, Oct. 24-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 606 Terminal Tower, Cleveland.

NOVEMBER

INVESTMENT CASTING INSTITUTE—Annual meeting, November 1-3, Detroit. Institute headquarters are at 27 East Monroe St., Chicago 2, Ill.

SOCIETY OF AUTOMOTIVE ENGINEERS—National fuels and lubricants meeting, Nov. 9-10, Bellevue-Stratford Hotel, Philadelphia. Society headquarters, 29 W. 39th St., New York.

FIRE HAZARD FOILED!



VINYL RESIN PLASTICIZERS AND VOLATILE SOLVENTS

Wherever highly combustible materials are used — as in this "dope room" at the Athol Manufacturing Company's Massachusetts plant, a potential fire hazard is *always* present!

Athol executives were keenly aware of the importance of *dependable, automatic* fire protection to provide the maximum in safety measures. So Athol called on Kidde — leaders in the field of fire extinguishing equipment.

Kidde engineers analyzed the various hazards, installed a 20-cylinder CO₂ extinguishing system which would automatically snuff out fire the instant it showed itself. In addition, pressure-operated trips were incorporated in the system to shut doors and windows, shut off fans and motors and to sound an alarm.

See to it that every fire hazard in *your* plant — machinery, flammable liquids, electrical equipment — gets the *best* in fire protection. Contact Kidde today!

Kidde



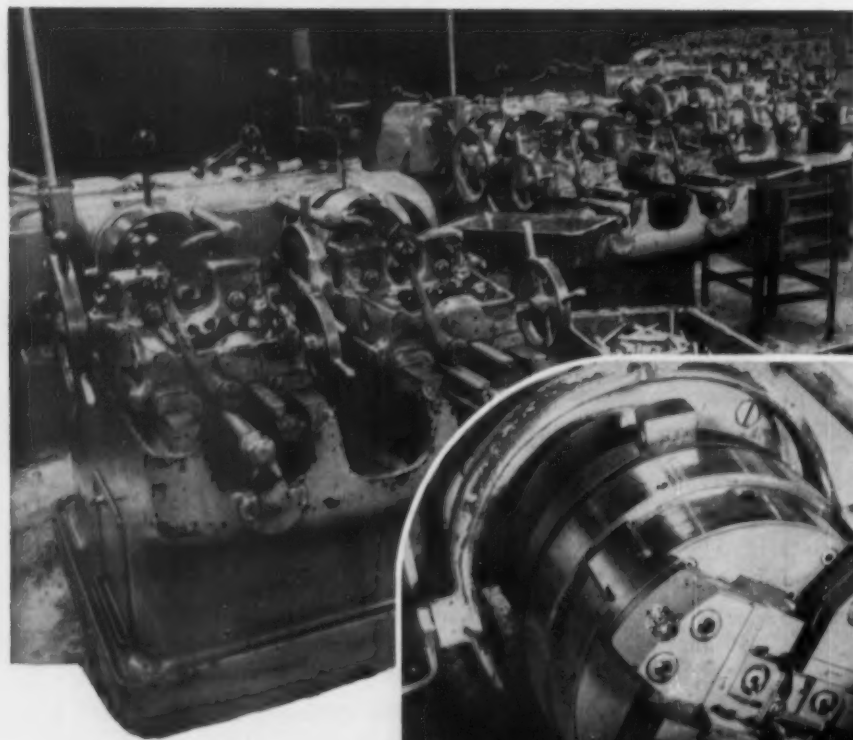
Walter Kidde & Company, Inc.
1049 Main Street, Belleville 9, N.J.

Walter Kidde & Company of Canada, Ltd., Montreal—Toronto

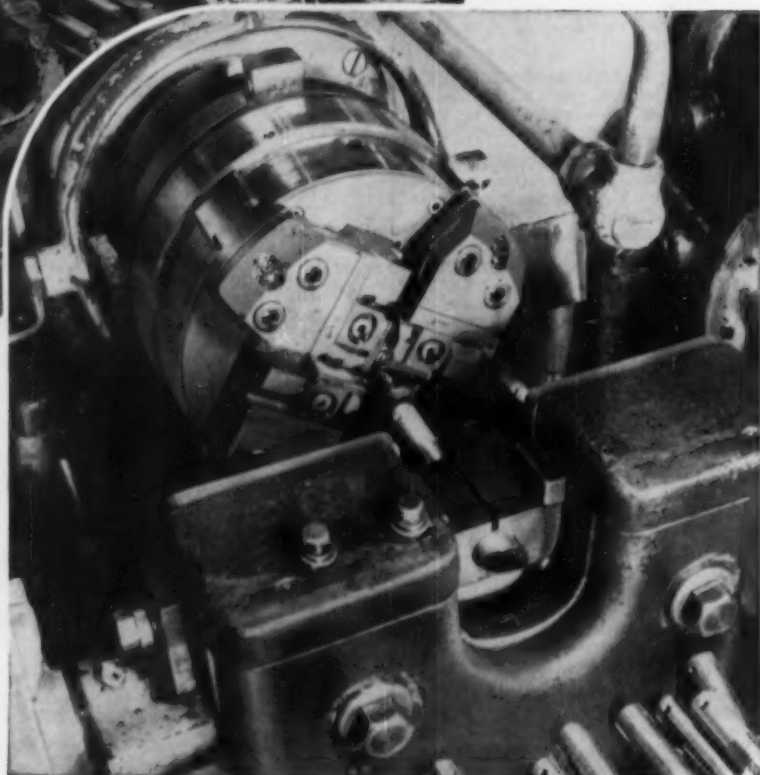
The words 'Kidde', 'Lux', 'Lux-O-Matic', 'Fyre-Free' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.

BOLTS threaded

ON A



THE WORLD'S



to ± . □ □ □

LANDMACO MACHINE

Using LANDIS Threading Equipment, the Chicago Screw Company of Bellwood, Illinois, is able to thread connecting rod bolts to better than Class 4 fit at normal production rates and economical tool cost.

Bolt blanks are of 8640 steel of 30-36 Rockwell "C" hardness. 1 1/16" diameter 16 pitch UN form threads must be cut 1-7/16" long over a cotter key hole. Specifications required a ±.001" tolerance on the Pitch Diameter of the thread, and finished threads are closely inspected for concentricity.

To perform this operation a 1 1/2 LANDMACO Double-Spindle Threading Machine equipped with Leadscrew, Hardened and Ground LANCO Heads, and Chasers of special throat length and hardness was installed. In normal production, this LANDMACO Machine regularly completes 127 threaded pieces per hour cutting at 15 surface feet per minute. On an average 400 threads

per head are produced between each regrinding of the chasers.

This installation illustrates the production advantages of LANDIS Equipment for difficult and exacting threading operations. The mechanically-controlled positive feed of the Leadscrew, the maximum rigidity of Die Heads designed for precision threading, and Chasers of special specifications—allow threading hard material with minimum cutting strain. As a result, threads are produced to close tolerances at economical production rates and low tool cost. For further information, ask for Bulletins H-75 (LANDMACO Machines) and F-80 (Hardened and Ground Heads). Please send specifications when writing.

LARGEST MANUFACTURERS OF THREAD GENERATING EQUIPMENT

• **LANDIS Machine CO.** **WAYNESBORO**
PENNSYLVANIA •



Ball Bearings



Cylindrical Roller Bearings



Spherical Roller Bearings



And now
Tyson Tapered Roller Bearings*

The broadest product line in the anti-friction field.



SKF—and its field engineers—are now adding Tyson Tapered Roller Bearings to their recommendations.

Constantly working to broaden the SKF line—to make “the right bearing in the right place” a watchword throughout industry, SKF has recently introduced new lines of pillow blocks, styles and sizes of Max type ball bearings, the improved Type “C” Spherical roller bearing.

And now SKF offers Tyson Tapered Roller Bearings.

This means that from SKF you get the broadest range of types and sizes of anti-friction bearings and the most extensive anti-friction experience.

More today, than ever before, dealing with SKF Field Engineers assures you of the right bearing in the right place.

7046

SKF®

BALL AND ROLLER BEARINGS

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.,
manufacturers of SKF and HESS-BRIGHT® bearings.

*Manufactured by TYSON BEARING CORP., affiliated with SKF Industries, Inc. as a subsidiary.



Nary a slip 'twixt the job and the disc

PHOTOGRAPHED AT MORRISON STEEL PRODUCTS, INC.

One look at this new Resin Sander Disc by CARBORUNDUM tells you it's no sissy. One trial in your shop *proves* how tough it is. It bites into metal fast...cuts free and cool...stays sharp from start to finish. The rugged all-fibre backing, plus a resin bond with

greater holding power, means far more work per disc. The edge holds shape longer, even on your most severe grinding jobs. Resin Sander Discs are designed for both snagging and surfacing operations, come in types and sizes to fit all Disc Sanders.

For a free demonstration of this new cost-cutter, call your CARBORUNDUM Distributor or salesman today. Or write The Carborundum Company, Niagara Falls, New York. In Canada: Canadian Carborundum Company, Ltd., Niagara Falls, Ontario.

Through application "know-how" and product quality

CARBORUNDUM
REGISTERED TRADE MARK

continually puts more **sense** in your abrasive **dollar**



Diamonds are a tool's best friend

Grinding keen edges on cemented carbide cutting tools can be tricky. The material is extremely hard and brittle...easily harmed by excessive heat. CARBORUNDUM's new B-7 Resinoid Bond Diamond Wheels grind unusually free and cool—re-

duce the danger of checking or cracking the carbide. Less pressure is needed to achieve accurate sizing to close tolerances, and to produce razor-sharp edges. And CARBORUNDUM's Diamond Wheels hold form better, last longer...deliver greatly increased

tool life. Ask your CARBORUNDUM Distributor or salesman for free copy of booklet, "Grinding Cemented Carbides," or write The Carborundum Company, Niagara Falls, N. Y. In Canada: Canadian Carborundum Company, Ltd., Niagara Falls, Ont.

Through product quality and application "know-how"

CARBORUNDUM

REGISTERED TRADE MARK

continually puts more **sense** in your abrasive **dollar**



**ENGINEERING
REPORTS:**



SEVENTY-SIX 10-hp d-c approach table motors for McLouth reversing roughing mill.

With the help of G-E system-engineered electrical equipment . . .

McLouth Steel improves hot strip production through increased flexibility and ease of maintenance

The new 60-inch hot strip mill at McLouth Steel Corporation's expanded Trenton, Michigan, plant utilizes individual d-c motors for each roll of roughing mill front and rear tables, as well as roughing and finishing mill approach tables, and pumpless rectifiers in unit substation arrangement to supply power to individual finishing stand d-c motors. These unique applications result in greatly increased flexibility and ease of maintenance.

In addition McLouth engineers predict savings of

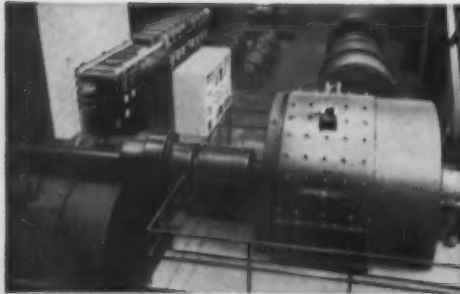
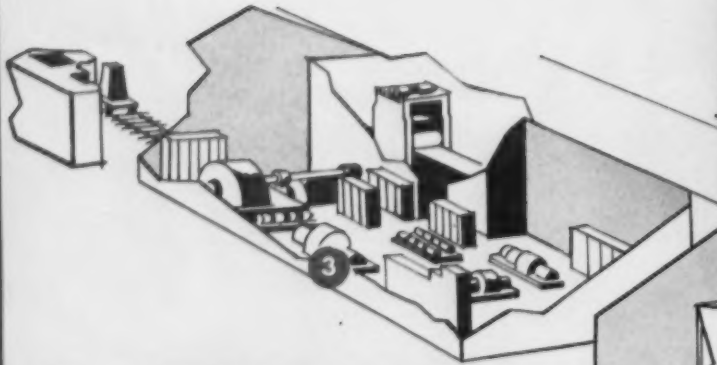
\$60,000 per year in lubrication costs alone by switching to individual roll drive d-c motors. This application of individual d-c motors eliminates the need for reduction and bevel gears and line shaft and therefore minimizes maintenance and periods of unscheduled downtime. 650-108

SEE ELECTRICAL SYSTEM LAYOUT ▶

GENERAL  **ELECTRIC**

How General Electric System Engineering

1 146 INDIVIDUAL ROLL MOTORS driving tables result in flexibility of maintenance, decreased operating costs. Engineered design integrates all table sections.



3 MAIN DRIVE for the blooming and slabbing mill is a 6000-hp d-c twin motor backed up by auxiliary m-g sets, d-c switchgear and duplex switchboard.

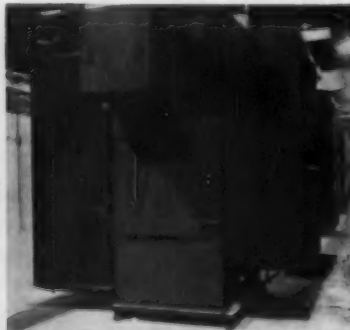


4 THIS SECTION of 4000-kw stand 3 rectifier features new ignitron stainless steel tanks and dual ignitors for dependable service—low maintenance.

Carefully engineered G-E electrical systems, as shown by this illustration, reduce time spent in installation and start-up—mill productivity is increased.



5 ECONOMY OF INSTALLATION for the hot strip mill is achieved by unit substation construction and close location of the rectifier equipment with respect to the stand motor drives.



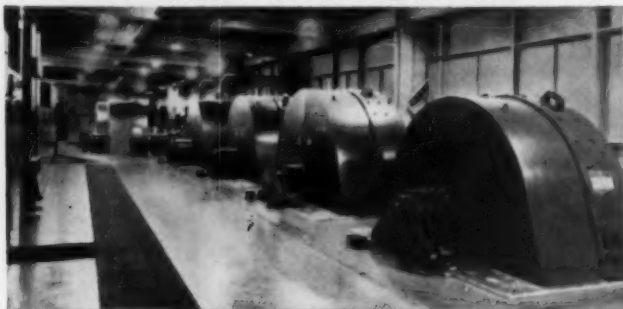
6 EACH STAND'S regulating auto-transformer allows operation over wide speed range by individual stand voltage control.



7 SYSTEM ENGINEERING eases motor room operation by centralizing master control functions for mill stands in this duplex control switchboard.

Helped McLouth Increase Productivity

2 A TOTAL OF 28,500-HP supplies the "muscle" for the 60-inch 6-stand hot strip finishing mill. Motor room stand 1 to 5 motors are rated 5,000-hp. Stand 6 motor (on right) furnishes 3500-hp.



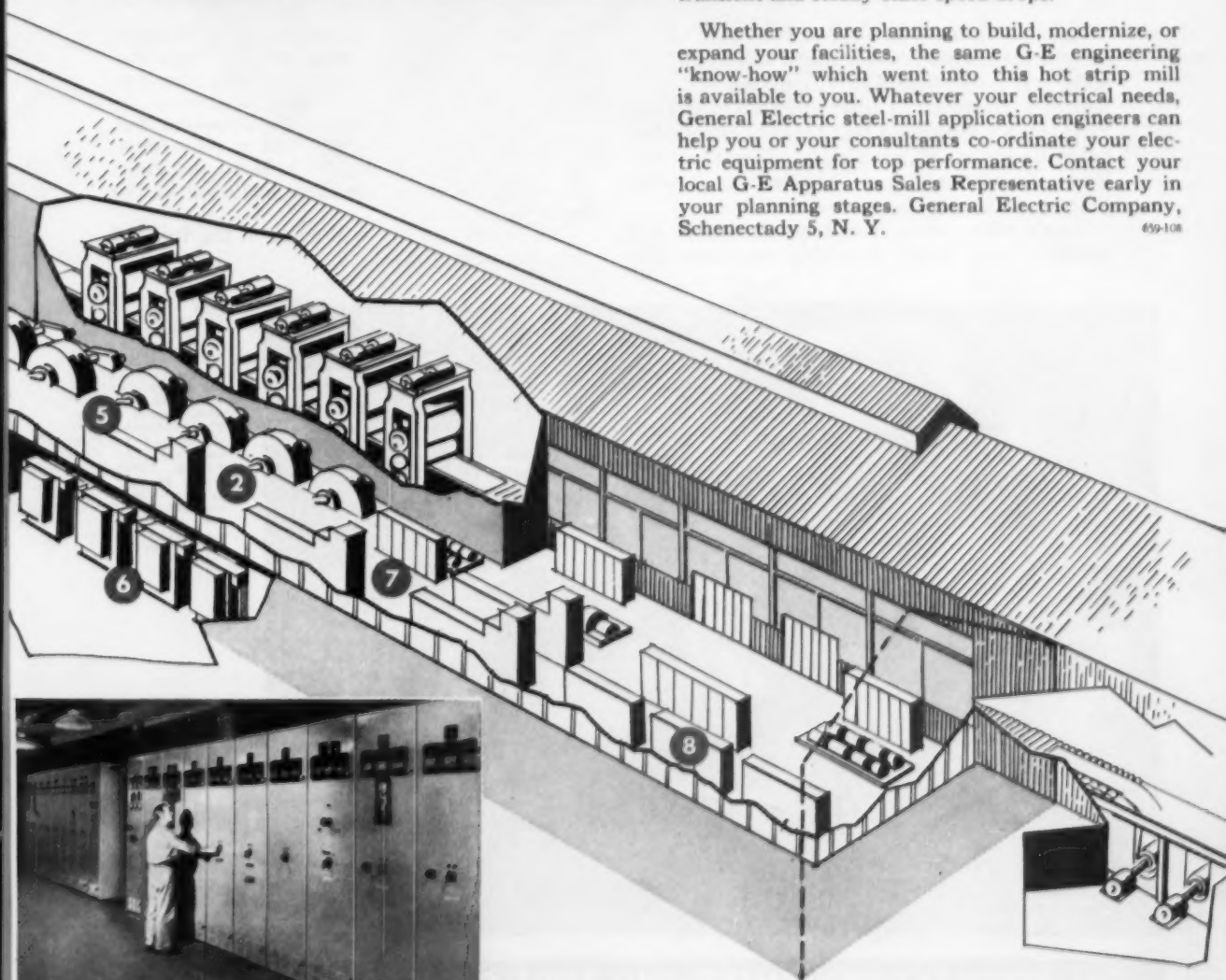
EXCELLENT EXAMPLE OF STEEL MILL PROGRESS

McLouth's new hot strip mill is an excellent example of the progress made in the application of electrical equipment to semi-continuous hot strip mills. This new plant, in full production 15 months from date of order, will produce up to one million tons of strip annually.

G-E designed individual-rectifier control gives the mill greater flexibility and simplicity of operation, plus a higher percentage of "on-gage" strip. G-E d-c drive motors are specially designed to withstand frequently repeated heavy loads with minimum transient and steady state speed drops.

Whether you are planning to build, modernize, or expand your facilities, the same G-E engineering "know-how" which went into this hot strip mill is available to you. Whatever your electrical needs, General Electric steel-mill application engineers can help you or your consultants co-ordinate your electric equipment for top performance. Contact your local G-E Apparatus Sales Representative early in your planning stages. General Electric Company, Schenectady 5, N. Y.

659-108



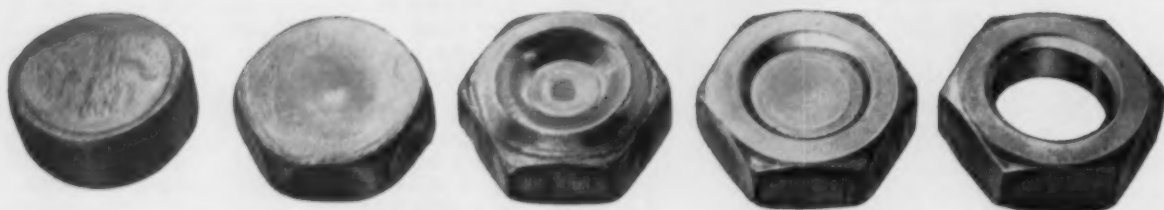
8 ALL INCOMING POWER flows through this a-c metal-clad switchgear. Reliable magnet-blast air circuit breakers provide service entrance and feeder protection.

Engineered Electrical Systems for Steel Mills

GENERAL  ELECTRIC

YOUNGSTOWN STEEL ROUNDS

used in manufacture of quality RB&W nuts



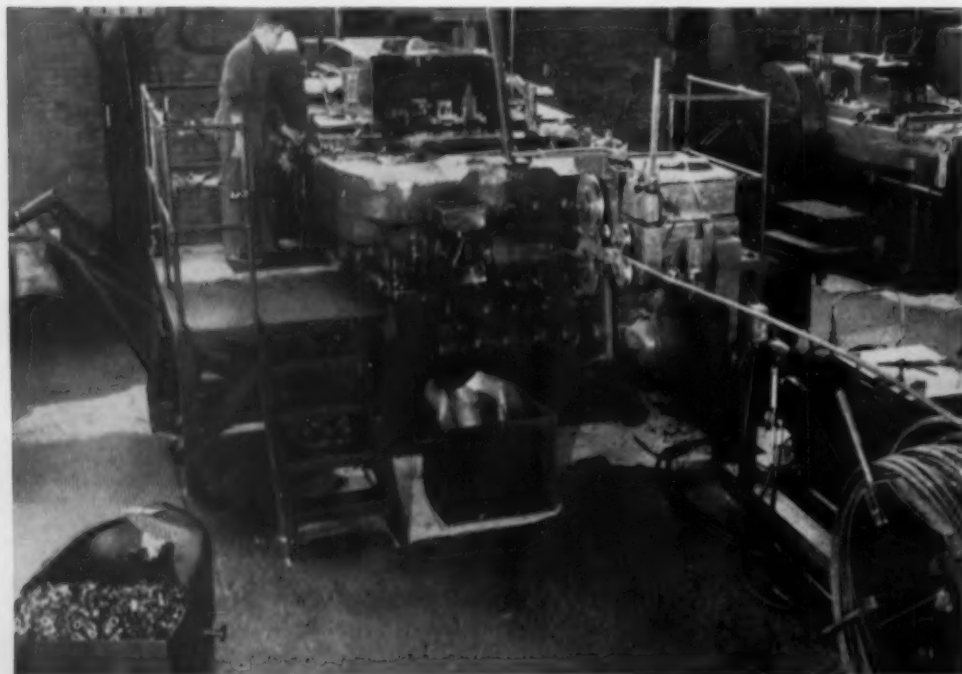
Russell, Burdsall & Ward Bolt and Nut Company pride themselves on the strength of their bolts and nuts. Justifiably, too, because they fabricate tremendous quantities of nuts from Youngstown Scrapless Nut Quality Steel. Not an ordinary steel, each step in making this Youngstown steel, from ore to the finished product, is closely controlled.

That's why, when nut formers punch and pound it, and when threading machines give

it another going over, a nut made of Youngstown Steel comes through a winner. This material is free of injurious seams and also machines cleanly in the threading operation.

When you order Youngstown Scrapless Nut Quality Steel, either in Bar, Rod or Wire form, you can be sure it will be held to the right tolerances. Nothing less than perfection is the Youngstown policy.

The payoff for you will come in the form of your finished product.



Five stages of nut making with Youngstown Scrapless Nut Quality Steel Rounds. Made by Russell, Burdsall & Ward, the end result shows what can be done with quality steel. The production machines are running smoothly at the Russell, Burdsall & Ward plants. Nuts by the millions are produced daily. Some are shown in the foreground.



THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of
Carbon, Alloy and Yaloy Steel

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

Musk Ox
OVIOS MOSCHATUS



Weatherproof

One of the most weatherproof of creatures in the world is the Musk Ox. In spite of the savage climate of their habitat (the tundra which rings the north polar sea), Musk Oxen do not migrate or hibernate, often pass their entire lives within a radius of a hundred miles.

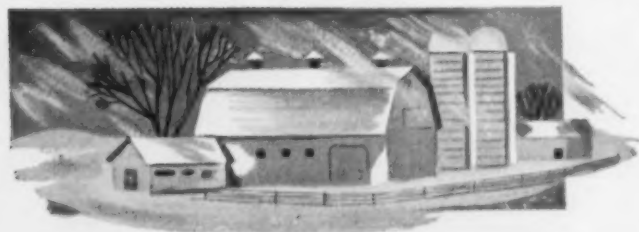
A long, thick "overcoat" of hair protects the Musk Ox from the severe storms of winter and the ferocious flies of summer. A deep pad of wool next to his skin insulates him from the intense cold.

One of the most weatherproof of metals is aluminum. A tough oxide coating which forms

naturally on an exposed aluminum surface is actually a weatherproof protection. It makes aluminum highly immune to the weathering and corrosive attacks of the elements which eat away other construction materials. Air and moisture do not affect the underlying metal.

Weatherproof, light and strong, aluminum is a versatile metal which is being used in the making of more and better products every day.

Aluminium Limited Sales, Inc. is the distributor in the United States for ALCAN aluminum from Canada. Why not investigate making your products of aluminum?



Weatherproof

In Farm, Residential and Commercial Buildings more and more aluminum is being used for its weatherproof superiority as well as its lightweight and high-strength advantages.

Aluminum
from Canada

Aluminium Limited Sales, INC.

630 FIFTH AVENUE • NEW YORK 20, N. Y.

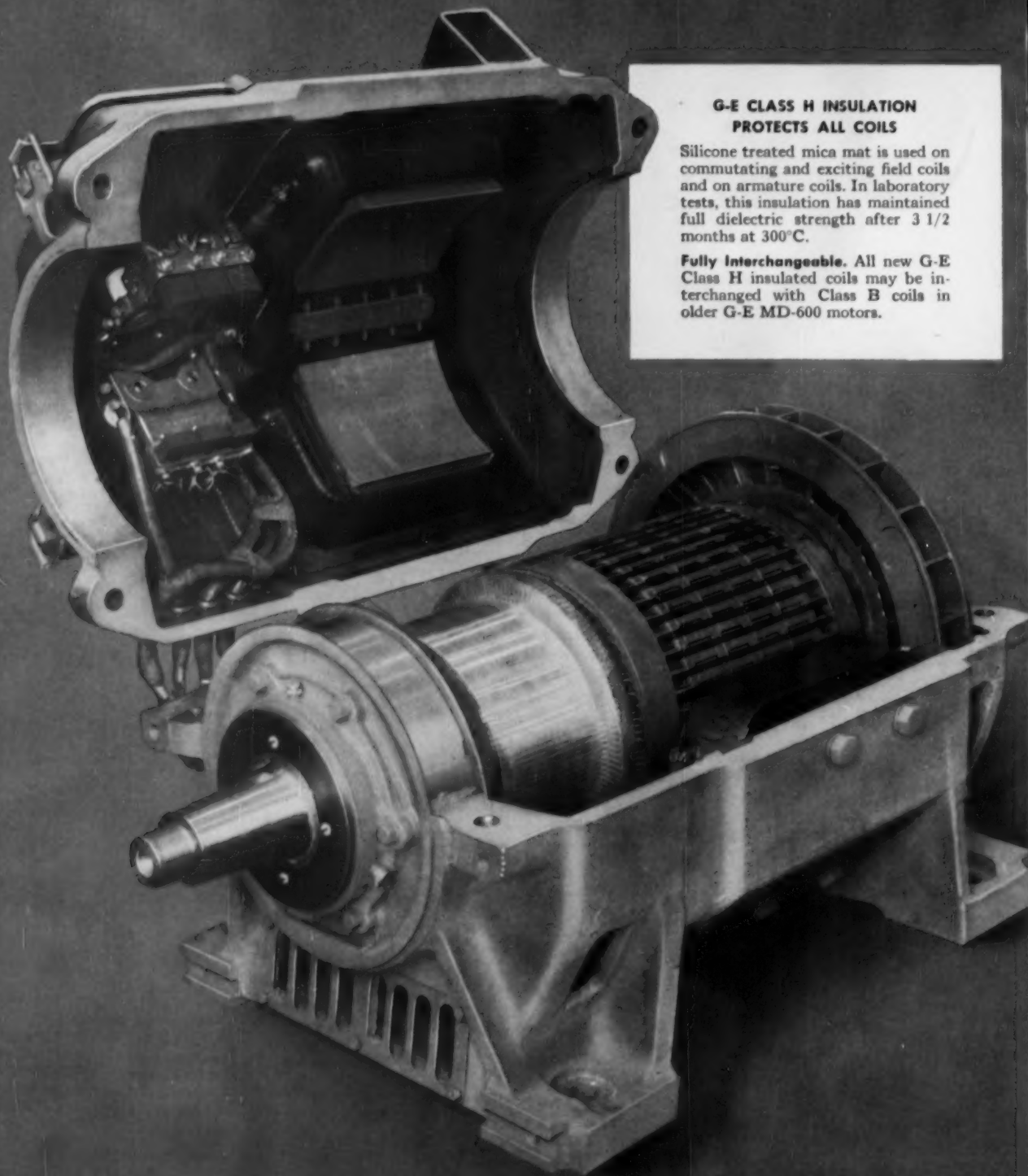
CLEVELAND • CHICAGO • DETROIT • LOS ANGELES • BUENOS AIRES • SÃO PAULO



PROGRESS IN
DIRECT-CURRENT DRIVES

NOW! Roastouts

NEW G-E MD-600 MOTORS



G-E CLASS H INSULATION PROTECTS ALL COILS

Silicone treated mica mat is used on commutating and exciting field coils and on armature coils. In laboratory tests, this insulation has maintained full dielectric strength after 3 1/2 months at 300° C.

Fully Interchangeable. All new G-E Class H insulated coils may be interchanged with Class B coils in older G-E MD-600 motors.

Virtually Eliminated on . . .

WITH CLASS H INSULATION

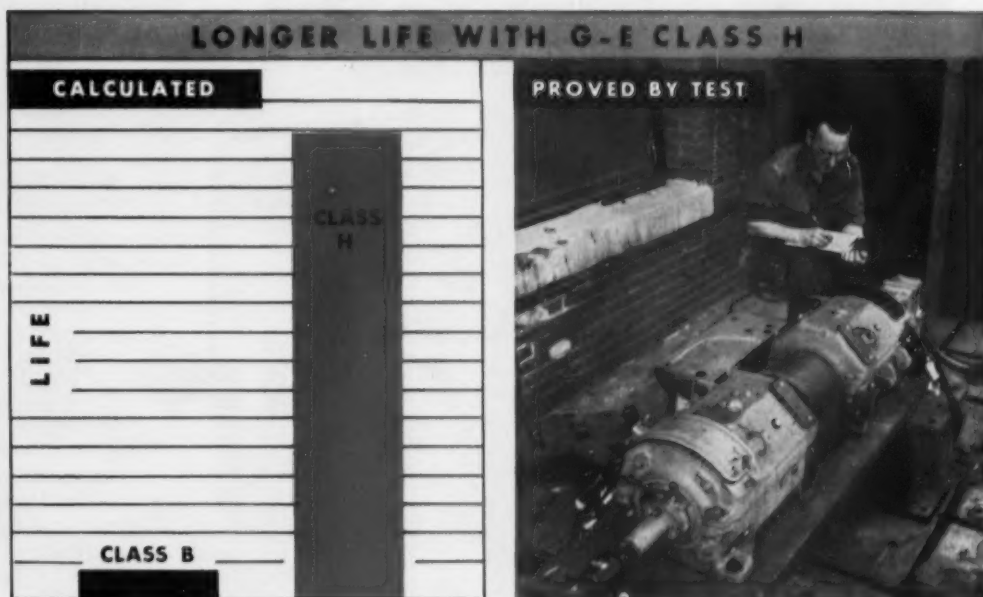
G.E. offers—in all MD-600's—Class H Insulated Coils

WHAT IS CLASS H? General Electric research has developed a combination of inorganic and silicone materials for a new insulation system now used in all MD-600 motors. These Class H materials will withstand temperatures up to 180°C continuously.

BETTER FOR HEAVY DUTY. Auxiliary mill motors often encounter unexpected high ambient temperatures, unforeseen extended duty or emergency conditions. Any one of these can cause "roastouts" from temperatures higher than the insulation capacity. The new G-E Class H insulation will resist up to 50°C more than Class B, resulting in longer motor service.

REWINDS ELIMINATED? On normal duty, insulation failure may be eliminated as the limiting factor in continuous armored motor service. Engineers calculate that each 10°C rise in temperature reduces the life of a given type of insulation by half. *Since G-E Class H will withstand 50°C higher than Class B, its life at the same temperature should be increased 2⁵ or 32 times!*

YOUR G-E SALES REPRESENTATIVE HAS COMPLETE INFORMATION. Contact him at your nearby G-E Apparatus Sales Office, or write Section 812-1, Direct Current Motor and Generator Department, General Electric Company, Erie, Pennsylvania.



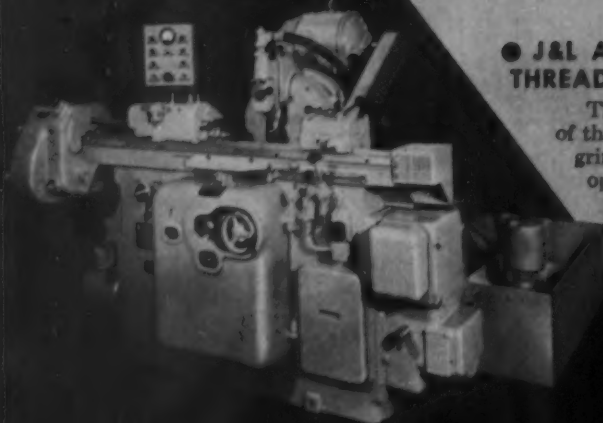
ENGINEERING STUDIES indicate that under identical operating conditions new G-E Class H insulated coils in MD-600 motors will last up to *32 times* as long as conventional Class B coils. Insulation failure may be eliminated as the limiting factor in continuous auxiliary mill motor service.

ACTUAL TEST with Class H and Class B motors coupled together *proves to date* the new insulation will last more than twice as long as the old. After burning out two Class B insulated motors, the one with Class H coils is still operating under exaggerated load, vibration and atmospheric conditions.

Progress Is Our Most Important Product

GENERAL  ELECTRIC

Looking for higher production

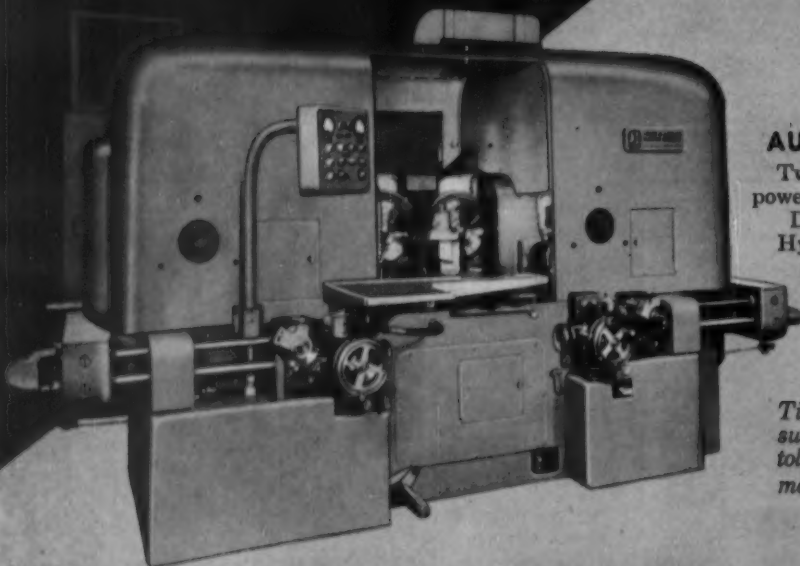


● J&L AUTOMATIC THREAD GRINDER

The self-truing, self-sizing mechanism of these machines has made thread grinding a practical, profitable production operation. They can be arranged for plunge grinding single or multiple grooves or contours, and for grinding threads with multi-rib wheels, either diamond or crush dressed.

MODEL E AUTOMATIC FORM GRINDER ●

Completely automatic cycle. High speed approach, wheel feed spark-out and withdrawal are positively controlled through simple cam action, ensuring constant, uniform operation under all conditions.



● MODEL D DUO WHEEL AUTOMATIC FORM GRINDER

Two 20" dia. grinding wheels, powered by 20 HP A.C. motors, or D.C. with rheostat control. Hydraulically operated vertical slide, mounts work holding fixtures. The stroke may be adjusted to accommodate a variety of work. These models are equipped with full vapor control.

Titanium alloys have been successfully ground to tolerances with this machine.



JONES & LAMSON MACHINE COMPANY

Jones & Lamson offers you a choice of methods for acquiring modern, profit-producing J&L equipment. In addition to outright purchase, J&L makes available several different "Pay-from-Productivity" plans at interest rates of 3 1/4 % and lower (add-on), and a broad variety of leasing plans.

Send today for complete information. Simply fill in the coupon, clip it to your letterhead and mail.

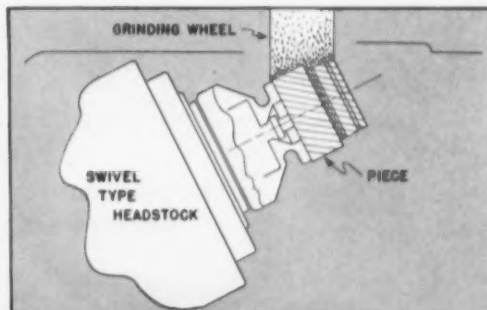
and greater accuracy?

...why not GRIND IT?

Newly developed materials, plus the constant demand for higher production and greater accuracy, are causing industry to step up its search for better methods of producing a great variety of work. In many instances it is found that Automatic Thread and Form Grinders can perform a great many different and difficult production jobs with greater speed and precision than was ever possible with the use of conventional equipment.

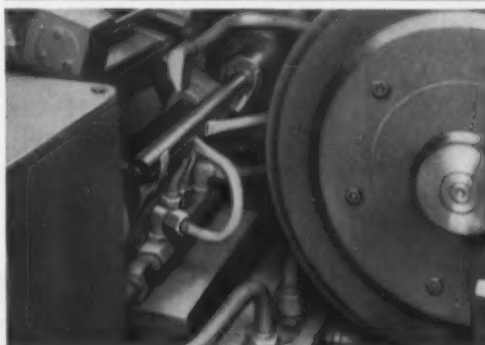
ANGLE GRINDING

This piece is held on an angle by an expanding air-operated arbor in the swivel type headstock of the J&L Model E. Four diam. are ground in one pass with a single wheel.



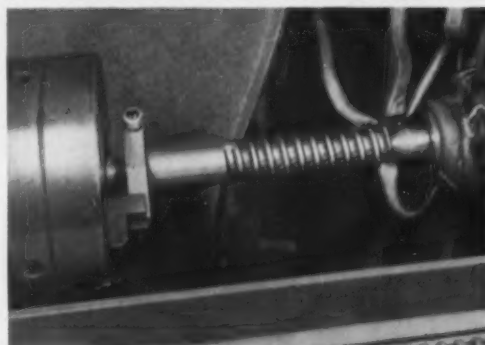
AUTOMATIC HANDLING

J&L Grinders are readily equipped with automatic handling for maximum output along production lines. This machine has a magazine feed for automatic loading and unloading of parts to be plunge ground for the automotive industry.



STOCK REMOVAL

J&L Wheel Spindles — grease packed for life, allow heavy stock removal such as on this worm (dia. 1.141", stock removed — .1235"). Plunge ground from the solid — one cut. Increased production 160% over previous method.



P.S. On the basis of increased quality and more production per labor hour, we invite the opportunity to improve upon your existing methods.

MACHINE TOOL DIVISION

UNIVERSAL TURRET LATHES • FAY AUTOMATIC LATHES • AUTOMATIC DOUBLE-END MILLING & CENTERING MACHINES • AUTOMATIC THREAD & FORM GRINDERS • OPTICAL COMPARATORS
AUTOMATIC OPENING THREADING DIES & CHASERS

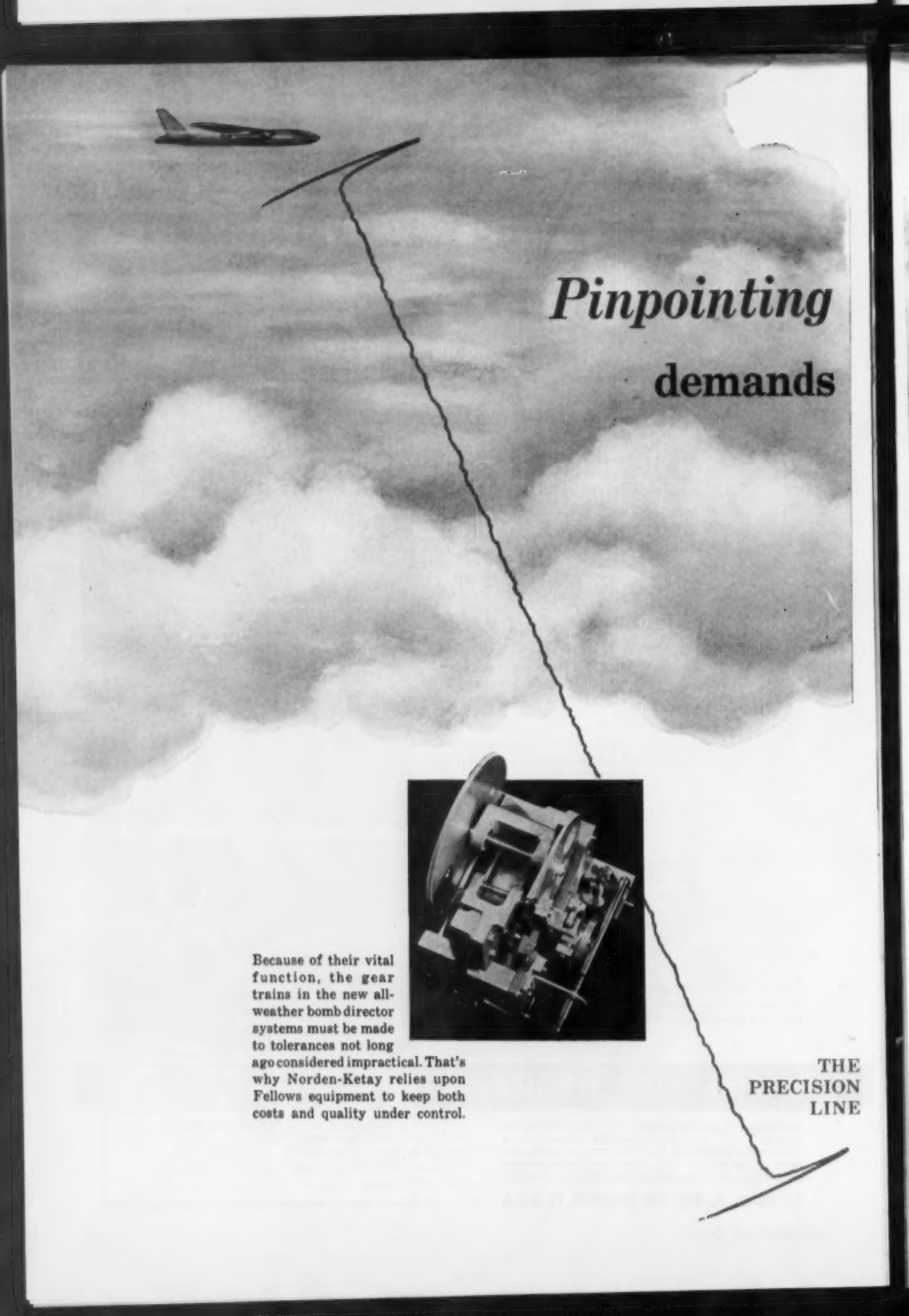
511 Clinton St., Dept. 710, Springfield, Vt., U.S.A.

JONES & LAMSON MACHINE COMPANY
511 Clinton St., Dept. 710, Springfield, Vt.,
U. S. A.

Please send me the J&L Machine Tool Replacement Information Kit.

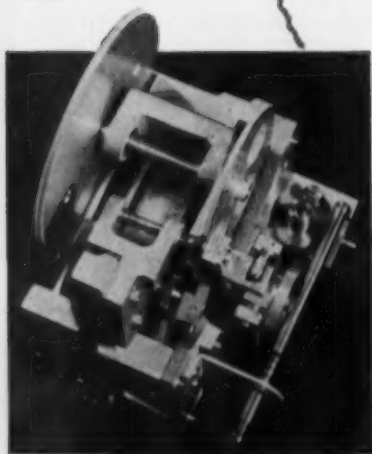
Name

Title



Pinpointing demands

Because of their vital function, the gear trains in the new all-weather bomb director systems must be made to tolerances not long ago considered impractical. That's why Norden-Ketay relies upon Fellows equipment to keep both costs and quality under control.



THE
PRECISION
LINE

invisible targets

HIGH PRECISION GEARS

Altitude: 40,000 feet! Ceiling: zero! The bombardier pushes a button... the automatic bomb director system goes into action... and another bull's eye is scored without even seeing the target!

The keynote of this amazing electro-mechanical mechanism, made by the Instrument and Systems Division, Norden-Ketay, is **PRECISION**. Because precision gears and gear trains play such a vital role, Norden-Ketay have built much of their production capacity around Fellows Equipment.

Fellows Precision Line offers a most efficient cost and quality control in the cutting, shaving and inspecting of fine-pitch gears. These machines and tools are fully integrated to provide a coordinated, balanced combination for close tolerance control in every step of gear production. The result: quality, economy and "unified" responsibility.

WRITE, WIRE or PHONE any Fellows Office for the information about the most recent developments in the Fellows line for fine pitch gears. If desired, they will give you all the facts about the Fellows Plan for Deferred Payment, too.

THE FELLOWS GEAR SHAPER COMPANY,
78 River Street, Springfield, Vermont.
Branch Offices: 319 Fisher Building, Detroit 2
5835 West North Avenue, Chicago 39
2206 Empire State Building, New York 1
6214 West Manchester Avenue, Los Angeles 45

Fellows Gear Production Equipment

MOTOR CONTROL FACTS
ON INDUSTRY'S
MOST COMPLETE LINE



FACT: Here is industry's newest and most advanced high-voltage starter!

This new line of Westinghouse high-voltage fused starters offers industry more protection—more operating simplicity than any other. Here are a few reasons why:

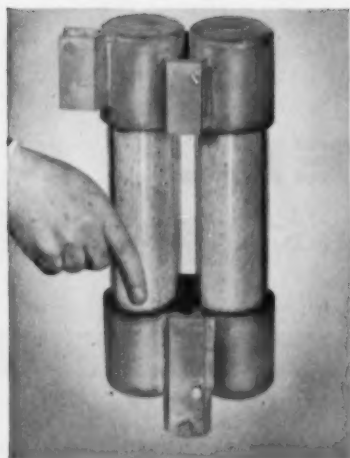
Extension of the BAL fuse line up to 400 amperes with the first and only 400-ampere, double-barreled, single-unit fuse; a new 50,000-kva air break contac-

tor featuring the most advanced arc interrupting action yet developed; and new enclosures providing new levels of convenience and safety.

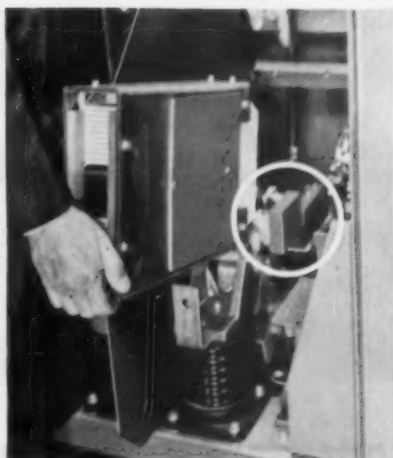
Booklet B-6535 has more facts on this outstanding new starter. Get it from your Westinghouse engineer—or write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

J-31898

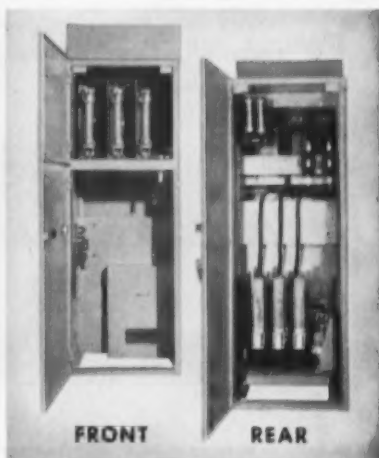
YOU CAN BE SURE... IF IT'S
Westinghouse



New 400-ampere, double-barreled, type BAL fuse features "no-bolt" brazed connections which insure equal division of current. Complete coordination of fuses is assured. Exclusive BAL single-barreled design for fuses up to 200 amperes is retained.



New air break contactor (200 and 400-ampere sizes) features a unique arc chute design which greatly simplifies inspection and maintenance of the contacts. Simply pull the arc chute down—contacts are immediately and conveniently accessible.



New enclosure design provides both mechanical and electrical interlocks; front and rear access DOORS; top-mounted bus arrangements; separate compartmentation of high and low-voltage components—all designed for maximum safety of personnel.

FROM INDUSTRY'S MOST
COMPLETE LINE OF
INDUSTRIAL CONTROL



CONTROL COMPONENTS • MOTOR CONTROL • ELECTRONIC CONTROL • CONTROL SYSTEMS • NATIONAL SERVICES

October 13, 1955

29

You can machine Stainless Steel parts like these at rates up to 90% of Bessemer screw stock

You can do it with free-machining ENDURO Stainless Steel Bars. They'll machine beautifully at every station on your automatics. And you'll be giving your duplicate steel parts the added strength, appearance, and heat- and corrosion-resistant qualities of stainless steel.

Included in the complete range of stainless steel analyses supplied in cold finished form by Republic's Union Drawn Steel Division are two grades, A.I.S.I. 416 and 430-F, that are fully 90% as machinable as Bessemer screw stock. Add to this machinability the close tolerance, accuracy of section, uniform soundness and fine surface finish provided by cold drawing.

All these qualities combine to help you produce fine-quality stainless steel parts at highest production rates and at lowest unit costs.

In addition to cold finished bars, Republic ENDURO Stainless Steel is available in hot rolled bars, special sections and wire. Republic metallurgists and engineers will give you expert, obligation-free assistance on applications, processing and use. Just mail the coupon for more information.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
3104 East 45th Street
Cleveland 27, Ohio



Please send me more information on:

- ☐ Free-Machining ENDURO® ☐ Titanium
☐ ELECTRUNITE® Mechanical Tubing ☐ "Nylok" Nuts

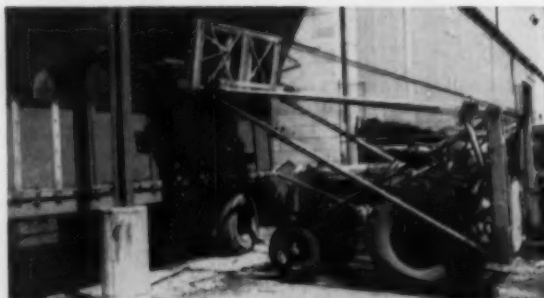
Name _____ Title _____

Company _____

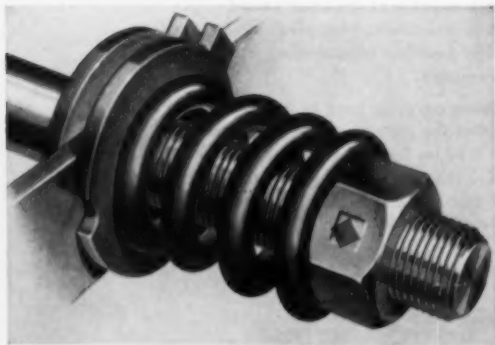
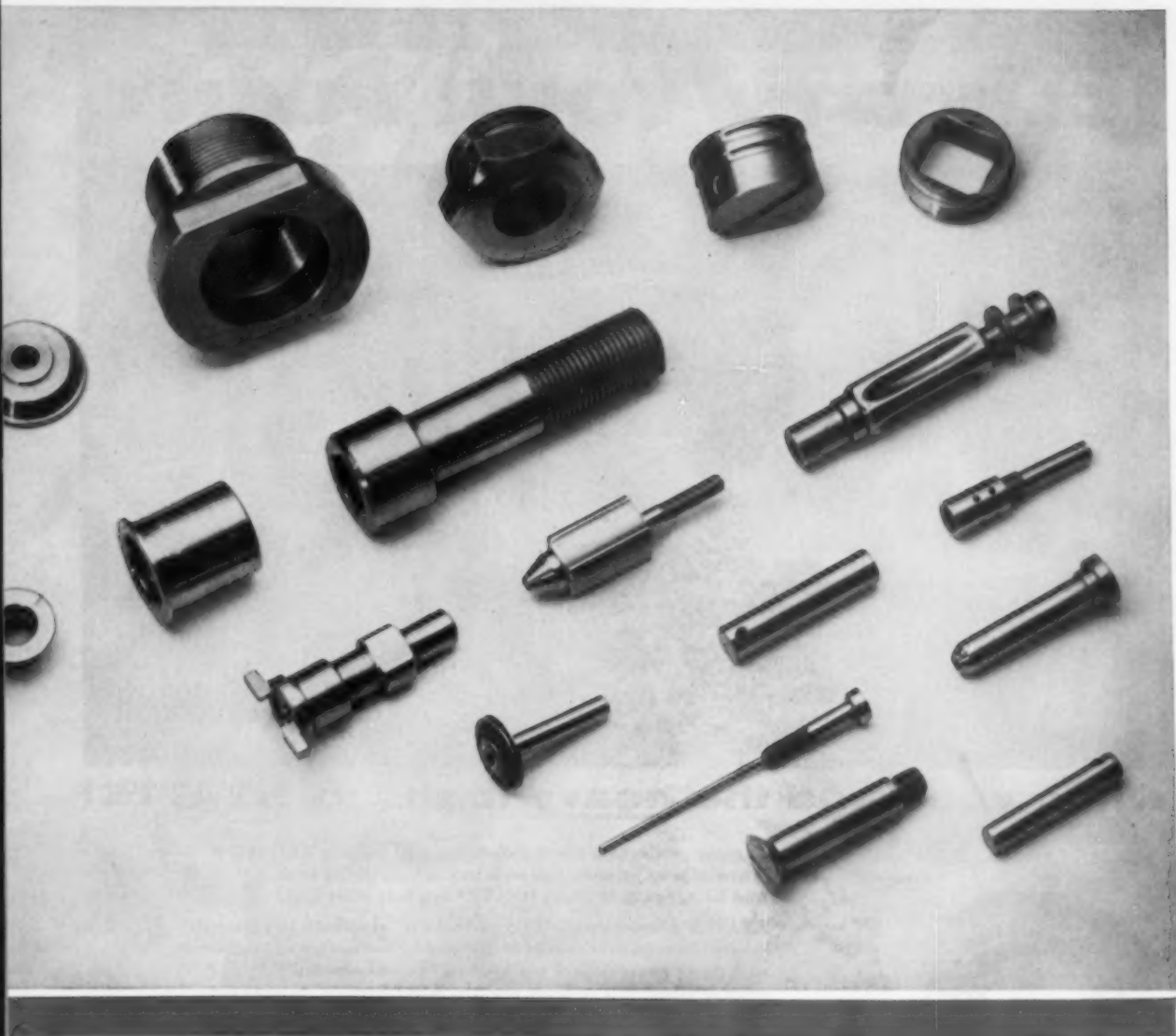
Address _____

City _____ Zone _____ State _____

E-0878



YOU CAN MASTER PROBLEMS LIKE THIS with ELECTRUNITE Mechanical Tubing. Interior scratches, not detected before assembly, wore out the hydraulic fluid seals in a hurry in the hydraulic cylinder of the Farmhand Hi-Lift Loader. Farmhand discussed the problem with Republic's Steel and Tubes Division. The solution—a switch to special smooth ELECTRUNITE Tubing. The result—lower production costs; fewer rejects; consistently uniform inside surface finish; longer life for the seal. ELECTRUNITE Mechanical Tubing is available in carbon and stainless analyses.

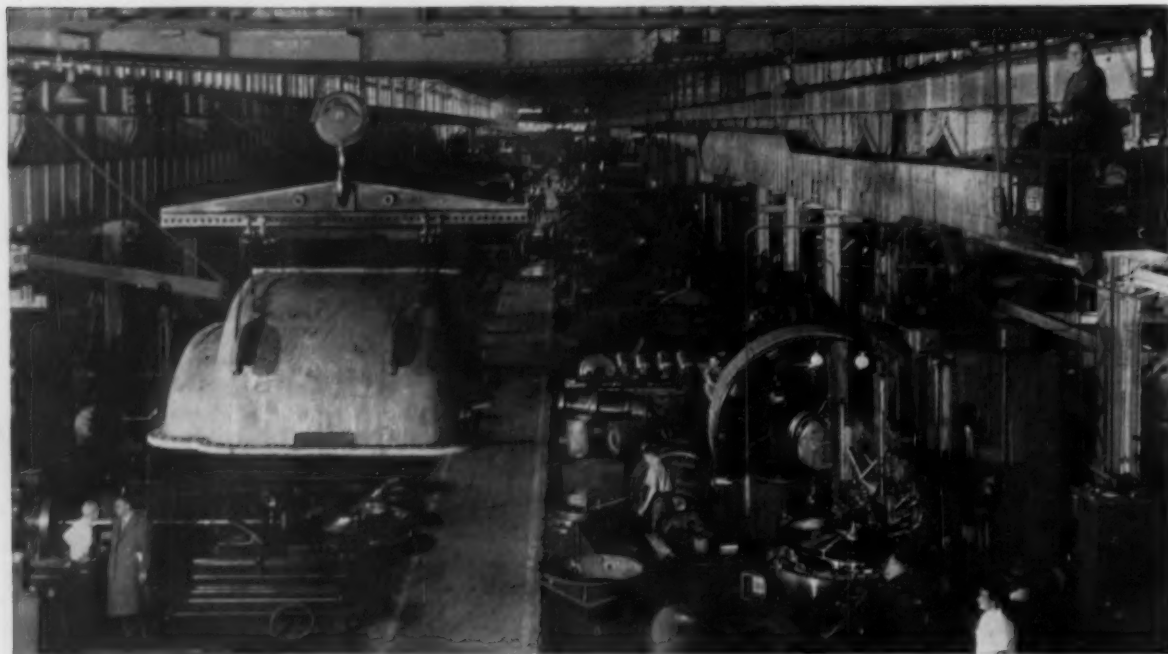


YOU CAN BE SURE THAT THIS NUT WILL STAY TIGHT wherever you stop wrenching. It's Republic's "Nylok" Nut. A nylon plug in the side forces the nut tight against the opposite threads as the nut is turned on. It can be assembled from either end, manually or mechanically fed. Can be locked in any position. Photo shows positive adjustment of spring compression.

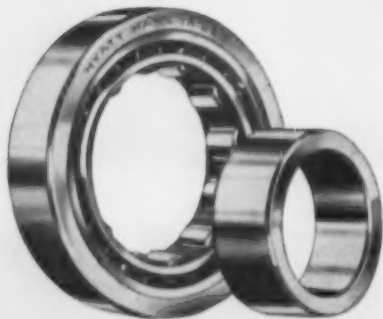
YOU CAN MACHINE TITANIUM PARTS like parts made from many other metals. This part is being hogged out of a titanium forging. It will then be turned, drilled, reamed, ground, tapped and threaded. Republic metallurgists recommend metals without prejudice. They will tell you whether titanium can be adapted to your product—will help you use it to advantage. Republic produces titanium and titanium alloys in hot and cold rolled bars, sheets, plates and billets.



HOW PRODUCTION WILL CLIMB IN YOUR PLANT



when you hand the heavy loads to **HYATTS!**



**THINGS RUN SMOOTHER
LONGER ON**

Keeping production curving upward—and keeping costs in line—is one of your primary interests as a management man. And here, again, is where HYATTS can help you!

HYATTS' phenomenal ability to "take it" results in significantly longer life expectancy—and hence greater utilization of equipment with lower maintenance costs—than "run-of-the-mill" roller bearings can possibly provide. Why? Because right at the outset, HYATT selects the choicest steels from America's foremost producers, instead of depending on a single limited source. Then these premium steels are heat-treated, machined, formed and inspected with fantastic precision on the finest equipment money can buy. And from drawing board to final installation recommendations, you profit from the fact that HYATT has more roller bearing engineering know-how than anyone else in the business.

That's why it's good business on your part to see that if HYATTS aren't already being specified for roller bearing replacements in your plant today, they will be from tomorrow on. By preventing bearing-failure bottlenecks, HYATTS can give your production curve a surprising lift—at the same time they're saving you a surprising lot of money!

HYATT

ROLLER BEARINGS

STRAIGHT 

BARREL 

TAPER 

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

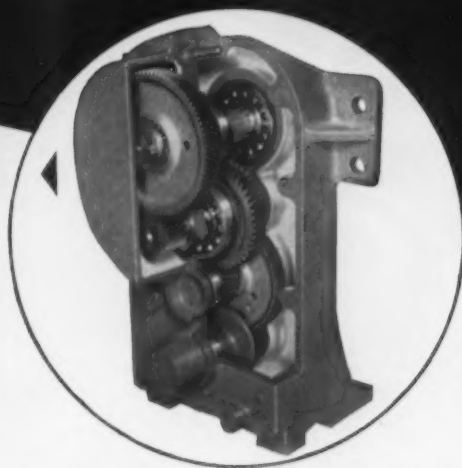
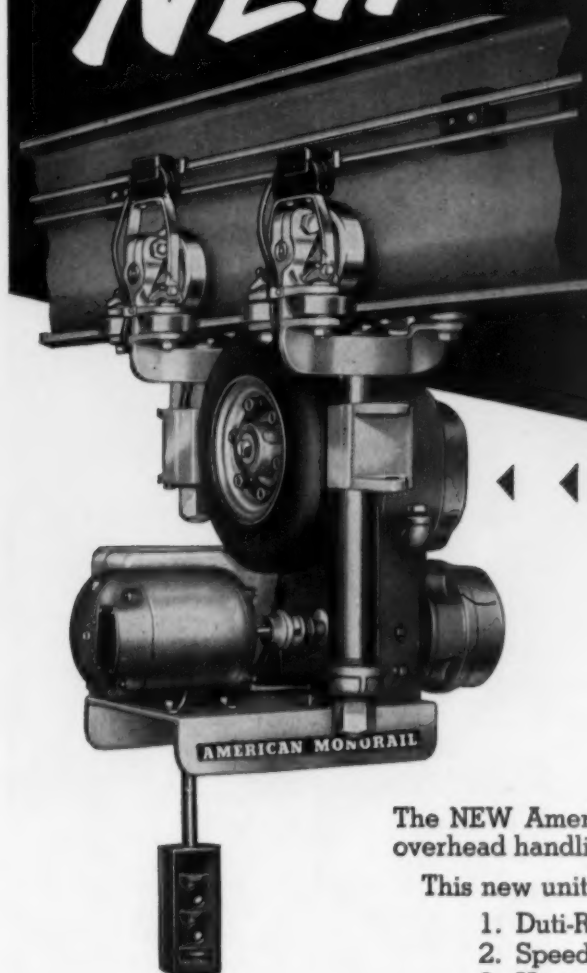
NEW...

AMERICAN

MONOTractor

for

Automatic Handling



The NEW American MonoTractor will fit precisely into any overhead handling system for automatic transfer of materials.

This new unit offers these advantages:—

1. Duti-Rated Life Time Gearing.
2. Speed Range from 35 to 350 F. P. M.
3. Horsepower Range for $\frac{1}{4}$ to 2 H.P.
4. Any Standard NEMA Motor.
5. Any Type Motor Brake Can Be Applied.
6. Operates on Any Smooth Flat Flange Track.

This precision built tractor unit offers continuous trouble-free transfer of any type of carrier for power propulsion. American MonoRail engineers offer wide experience in the application of these units. Let them help you solve your automatic handling problems.

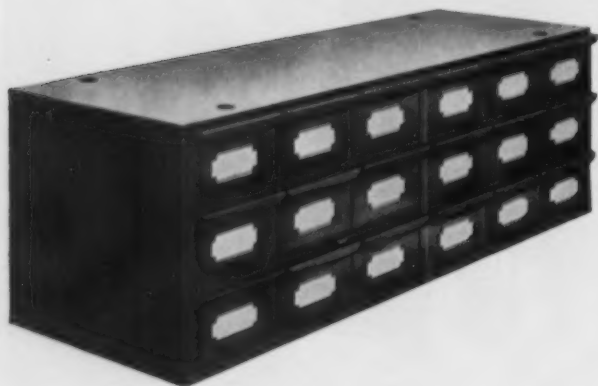


MonoRail

COMPANY

13103 ATHENS AVENUE • CLEVELAND 7, OHIO
[IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.]

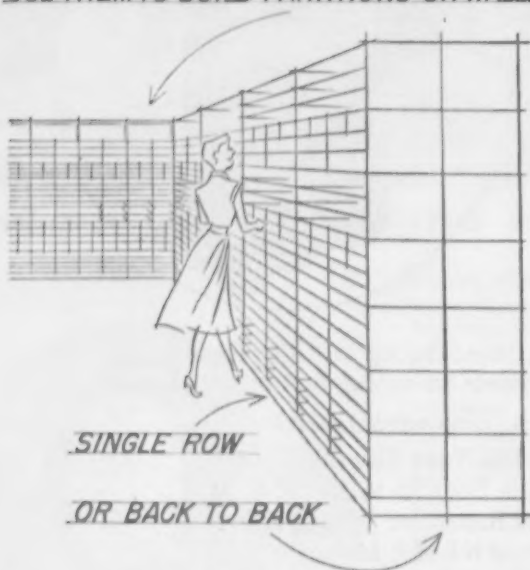
HOW TO USE HALLOWELL STORAGE WALLS IN MAKING ECONOMICAL STORAGE SPACE



STACK THEM AGAINST WALLS
-AS HIGH AS YOU WANT-
-AS LONG AS YOU WANT-



USE THEM TO BUILD PARTITIONS OR WALLS



SINGLE ROW

OR BACK TO BACK



SET THEM UP ADJACENT TO MACHINES AND OTHER
WORK AREAS TO STORE BOOKS, TOOLS, PARTS, ETC.



Prime Cold Rolled Steel • All Welded and Finished
with Baked on Enamel • Interchangeable Drawers •
3 Different Size Drawers Can Be Intermingled in the
Same Case • Stocked by Leading Shop Equipment Dealers •
Send for Bulletin 2093 • Hollowell Shop Equipment
Division, Standard Pressed Steel Co., Jenkintown 17, Pa.

HALLOWELL SHOP EQUIPMENT DIVISION

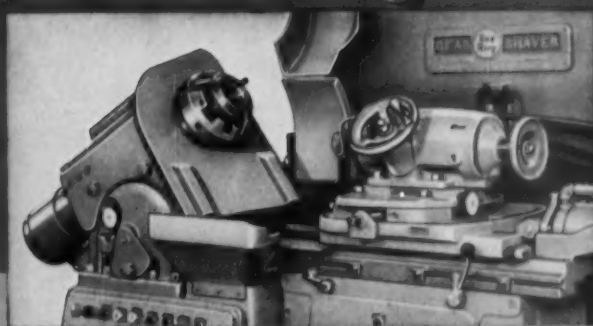
STANDARD PRESSED STEEL CO.

SPS
JENKINTOWN PENNSYLVANIA

BENCHES (CABINET, WORK, UNIT) • STOOLS AND CHAIRS • SHOP DESKS • TOOL
STANDS AND CABINETS • DRAWERS, DRAWER TIERS • STEEL CARTS • SHELVING

New Machine Shaves INTERNAL GEARS Faster and to Closer TOLERANCES

This new Red Ring Model "GCR" is a high production, high precision shaving machine for a broad range of internal gears. It provides two methods of shaving and many advantages which heretofore were available only on external gear shaving machines.



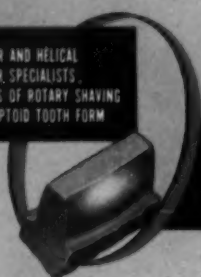
- It will precision shave all spur or helical internals 3" to 12" PD, up to 4 diametral pitch with face widths to 2½".
- It will operate on an automatic and selective feed cycle.
- It provides the opportunity to use a new, rapid PLUNGE-CUT shaving cycle in addition to conventional shaving.
- Crowning by the Plunge-cut method is optional.
- It will taper-shave gear teeth.

- It assures precision comparable to that established by Red Ring Machines for external gears.
- It reduces loading and unloading time to a minimum.
- It handles gears having integral shafts.

When using the automatic feed cycle a selected number of cutting strokes, each with its own selected increment of up-feed, can be combined with whatever idling strokes are desired. At the end of the cycle the machine automatically stops in the proper backlash position for rapid unloading.

If your manufacturing program includes internal gears, write for complete information on this new shaving machine.

SPUR AND HELICAL
GEAR SPECIALISTS.
ORIGINATORS OF ROTARY SHAVING
AND ELLIPTOID TOOTH FORM



NATIONAL BROACH & MACHINE CO.

5600 ST. JEAN DETROIT 13, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

2113

Can you guess what these American

A

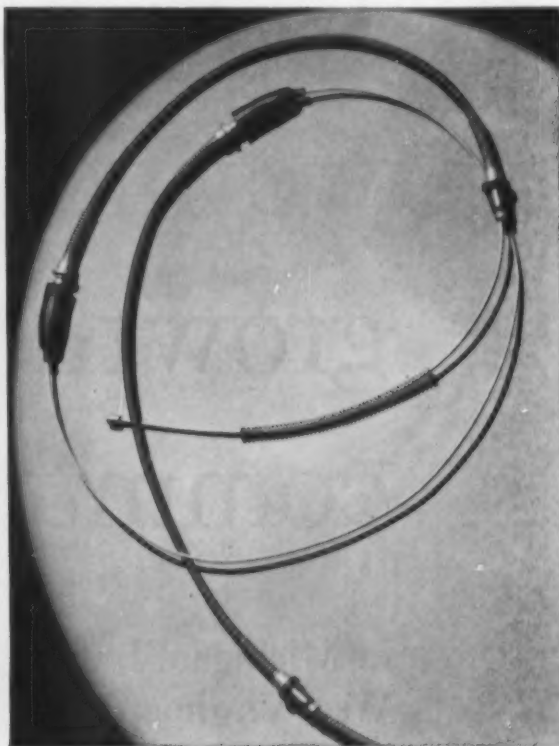


Quality Springs are used for?

B



C



ANSWERS

A

CAR-PROOF. You're looking at the wall of a striking new parking garage just erected in Chicago. American Steel & Wire furnished miles of stainless steel strand that runs continuously from the roof to the ground—where it is stretched tight by means of American Quality Springs. Appearance is breathtaking, and the novel construction prevents cars from rolling off the concrete slabs.

B

ONE LUNG GRAIN BIN. When grain is stored, it *must* be adequately ventilated. American Steel & Wire produced thousands of these enormous steel "springs" that can withstand tremendous radial loads. In fact, they are laid on the floor of the bin, wrapped with AS&W Insect Screen, then covered with tons of wheat. Air can then be pumped through the tube, and the wheat stays dry and in good condition.

C

YOU USE IT ALMOST EVERY DAY. It's not a terrifying medical instrument. Rather, this collection of cable, springs, clips and rubber boots is the entire parking brake assembly for a famous automobile. This entire unit was produced by American Steel & Wire.

●Remember, American Steel & Wire can supply *completely fabricated* wire and spring assemblies in quantity. Get in touch with your AS&W salesman...take advantage of American Steel & Wire quality—and price.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



USS AMERICAN QUALITY SPRINGS

UNITED STATES STEEL

To help you find that just-right plant site...

Every day we measure the growth of 2319 communities

in Michigan, Indiana, Ohio, Kentucky,
West Virginia, Virginia, Tennessee

THE RESULT... a perpetual inventory of plant-site information about a 45,000-square-mile territory abounding in low-cost fuel and power for all types of metal-working industries. This data is unequalled in up-to-the-minute accuracy and completeness.

For nearly fifty years, the American Gas and Electric System has served practically every home and business in this growing seven-great-state area that

now includes 2319 towns.

Our men are in these communities every day, every week of the year—a network of on-the-job personnel carefully reporting changes of economic and social import.

Whether your need is dispersion, decentralization or expansion, the American Gas and Electric Company can help simplify your plant-site selection problem. As it has for hundreds of other

manufacturers, both large and small, it can bring pertinent information right to your desk ready for measurement by your own yardstick.

You will find that this service will save many hours of valuable executive time in investigation and analysis. There is no charge. All we have to sell is power from capacity sufficient to meet the needs of any industry.

AMERICAN GAS AND ELECTRIC COMPANY
30 CHURCH ST., NEW YORK 8, N. Y.

OPERATING AFFILIATES:

APPALACHIAN ELECTRIC POWER COMPANY

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KENTUCKY POWER COMPANY

KINGSPORT UTILITIES, INC.

OHIO POWER COMPANY

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To get a more detailed description of the many industry advantages in the American Gas and Electric service area, write for the brochure "A 7-State-Plant-Site Trip—in 5 minutes."

You'll learn about water, transportation, labor, taxes, raw materials, education, community character and atmosphere and many other data necessary for pleasant, profitable plant operation. Address your inquiry in confidence to Mr. Lee Davis, Manager Area Development, 30 Church Street, New York 8, New York.



how to give any
air cylinder...

Hydraulic Smoothness



If you use air cylinders in precision operations, you'll want to know more about Bellows Hydro-Checks — precision hydraulic control for air cylinder power. Write for Bulletin HC-601 Address: The Bellows Co., Dept. IA 1055, Akron 9, Ohio. In Canada: Bellows Pneumatic Devices of Canada, Ltd. 14 Advance Rd., Toronto, Ont.

Compressed air has a natural "bounce"—ideal for many operations. But where absolute smoothness of piston rod movement is essential, bounce can be troublesome.

You can make any air cylinder piston rod behave with Bellows Hydro-Check control. This precision control unit, mounted parallel to, or in line with the air cylinder, sets up an opposed, steadying control force that smooths out chatter instantly.

You can have Hydro-Check control when you want it—for a fraction of the stroke, or all of it. With certain models of Hydro-Checks you can have "Skip"—or intermittent checking action; or you can stop an air cylinder piston at any point in its travel for a predetermined time and then resume traverse.

Hydraulic control can be on either advance or retract strokes or on both.

The Bellows Co.

AKRON 9, OHIO

1223-A

October 13, 1955

39

Why this section?

**When you can
safely specify this**



How Betatron Inspection

Cuts Production Costs

New Opportunities for design economies are being opened for many manufacturers by Allis-Chalmers 22-million-volt betatron. For example, it is possible to eliminate overdesign because betatrons permit thorough inspection of forgings and castings. The result is a product far easier to manufacture, with sizable reductions in raw material requirements.

In addition, there is a marked competitive advantage when betatron inspection provides extra assurance of quality control.

Betatrons are being used to inspect parts or whole machines. In some cases, they inspect alignment of parts deep in an 8-in. steel section. Cracks only .002 in. wide are readily detectable.

Betatrons are fast. They radiograph equipment on an assembly-line basis if desired. In most cases, present personnel can operate them.

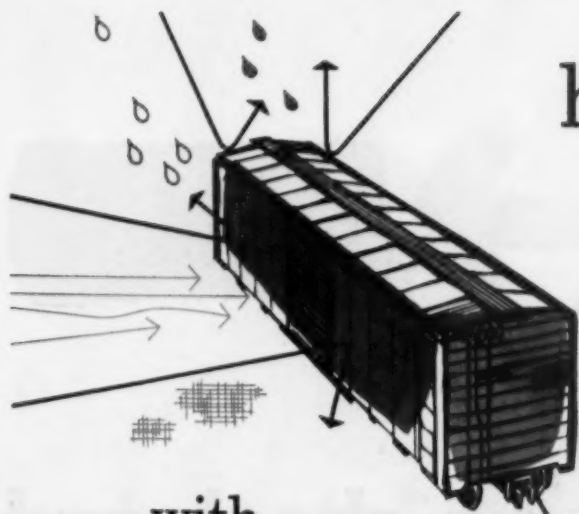


*Get complete information from
your nearby A-C office or write
Allis-Chalmers, Power Equip-
ment Division, Milwaukee 1,
Wisconsin.*

A-4835

ALLIS-CHALMERS





how
to
rust-proof
a
freight-car

with
FERRO-PAK[®]

by Cromwell

A leading wire manufacturer discovered this economical, easy way to use Cromwell Ferro-Pak VCI Paper to insure rust-free shipping of bright finished wire. Wire coils are shrouded with sheets of Ferro-Pak and the paper is used to line the sides of the car as well. Chemical vapors travel outward from both sides of the paper, forming an invisible protective film around the wire that doesn't give rust a chance to get a foothold. Non-toxic Ferro-Pak vapors are effective almost indefinitely under most conditions.

Think how this clean, fast, easy rust preventive method

can save you money! No more dipping, slushing, scraping, wiping. No more costly extra packaging. To protect any ferrous metal product, you simply wrap it and it's rust-proofed—unwrap it and it's ready to use. Ferro-Pak comes in rolls, sheets, bags, envelopes, liners and covers. And we combine it with many other materials for a wide range of special uses.

For an interesting brochure on how you can cut costs with Ferro-Pak in packaging, shipping, storage and maintenance, write on your letterhead today.



Cromwell

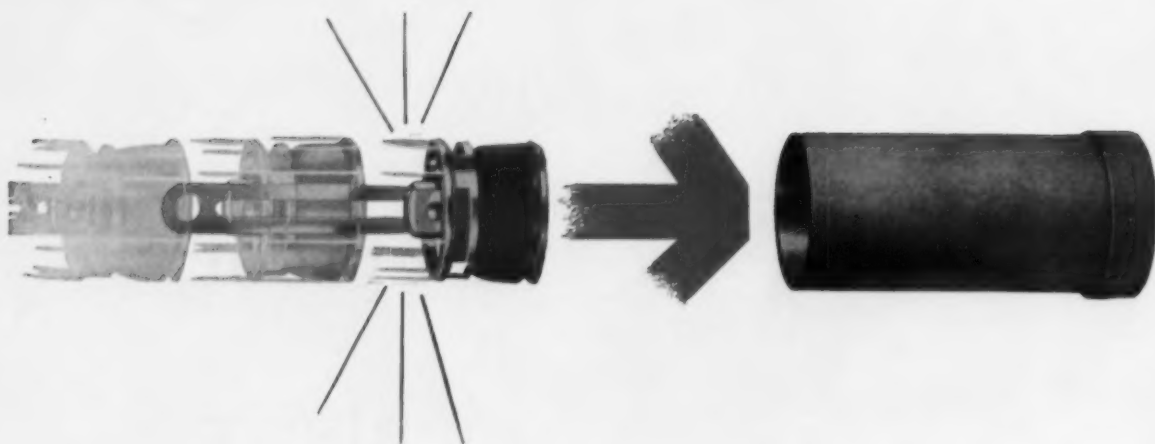
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MANUFACTURERS OF: Papers (Impregnated • Coated • Laminated • Reinforced • Flexible) Bags • Sacks • Liners • Covers • (Single and multiwall construction, using all types of material to carry, cover or protect all types of products.)

See you in
Booth #604
at the
SIPHME Show

*Shrouding with
Ferro-Pak VCI Paper
quickly transforms an ordinary
freight-car into a huge
rust-proof package.*





How to soak up shock and

**Underwood Corporation
did it by using
Republic
ELECTRUNITE
Stainless Steel
Tubing**



This was the problem: find a material for the cylinder in the carriage shock absorber on an accounting machine. The cylinder must have an accurate bore, little variation in diameter, and negligible eccentricity. It must also have a suitable finish to reduce drag, because the piston which fits inside must be completely retracted in less than a tenth of a second.

Republic metallurgists suggested ELECTRUNITE Stainless Steel Tubing. It was drawn to meet dimensional requirements. The finish was excellent. And Underwood reports good service life because of excellent wearing qualities.

Republic Steel Corporation
3104 East 45th Street
Cleveland 27, Ohio



- ☐ Enduro® Stainless Steels
- ☐ ELECTRUNITE® Stainless Steel Tubing and Pipe
- ☐ Republic Nuts and Bolts
- ☐ Republic Chateaugay Pig Iron

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____



BUSINESS MACHINE PARTS COST LESS because they last longer when they're made of Republic Enduro Stainless Steel. On this Addressograph-Multigraph office machine, ink corroded the carbon spring steel from which the ribbon guards and lister spacing bands were made originally. Carbon steel also cracked under the operating strain. Enduro Stainless Steel resists this corrosion, has the necessary springiness and wears well, despite the abrasive action of moving the ribbon.

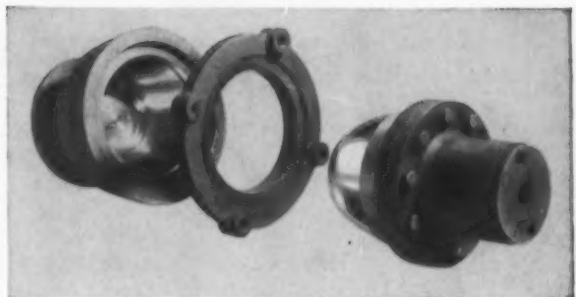
cut costs!



Underwood now saves 75 cents on material costs for each shock absorber.

This is only one of many customers for whom Republic has saved money. Sometimes we save material costs. Sometimes production costs. Often, both. And since we manufacture both stainless steel and carbon steel tubing in many analyses, we are equipped to help solve all kinds of tubing problems.

Fill out the coupon below for more facts on Republic ELECTRUNITE Mechanical Tubing. Or call your nearest Republic district sales office.



ECONOMICAL MACHINING IS ONLY ONE REASON why a leading maker of heat-resistant glass products uses Republic Chateaugay Pig Iron for glass molds. This premium pig iron, supplied exclusively by Republic, also assures a dense, fine grain structure; longer mold life; fast-flowing and even-cooling characteristics. Hard surfaces resist heat and wear.

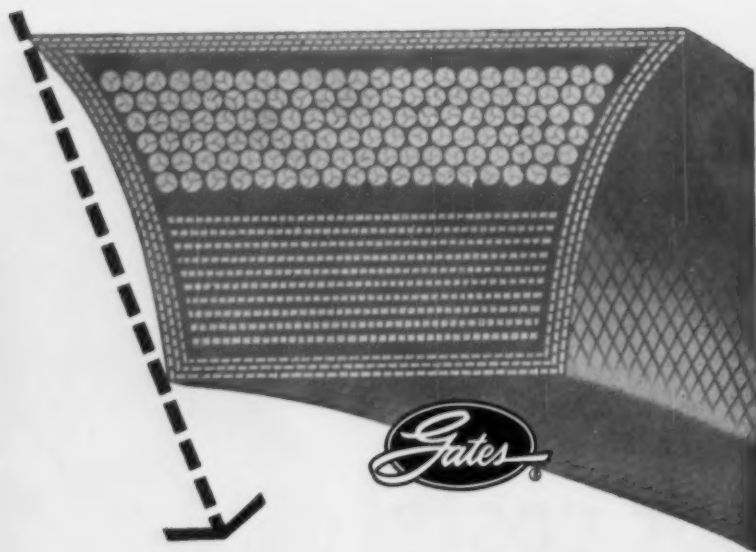
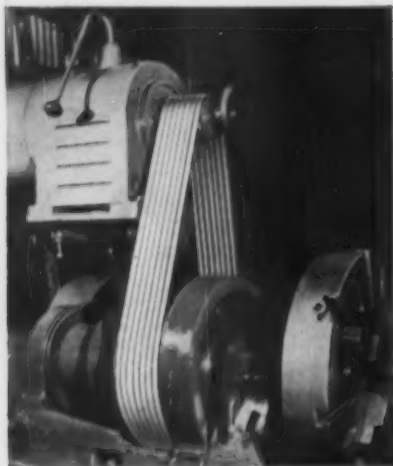


CUTTING COSTS ALSO APPLIES TO BUYING FASTENERS for your assembly and maintenance work. One call to your Republic Distributor gets all the fasteners you need. There's no shopping around, no time lost. Paper work is reduced. And, you get exactly what you want because Republic makes and stocks over 20,000 types and sizes of regular fasteners, everything from machine bolts to sheet metal screws. You can depend on Republic Fasteners for quality, uniformity, ease of application, long service life. Quick delivery, too.

REPUBLIC STEEL

*World's Widest Range
of Standard Steels
and Steel Products*

This large lathe was formerly driven by a flat belt which slipped on heavy cuts, stalled and broke tool bits. Savings on broken tool bits alone offset the cost of the drive the first year—and production was increased 25% after the V-belt drive was installed.



concave sides lengthen V-belt life ...cut costs



Fig. 1 Hundreds of plants that keep track of V-belt drive costs know this: Gates Vulco Ropes . . . the V-belts with *concave sides*... wear much longer and cost less per year of service.

Here is the interesting reason why:



When a Gates V-belt bends around the sheave, the *precisely-engineered* concave sides (Fig. 1) fill out and become straight. Thus the sides of the belt make full, uniform contact with the pulley (Fig 1-A).

Naturally, uniform contact distributes the wear *evenly*. And *even wear* means *longer wear*.

Longer wear saves not only on replacement

costs; it also saves the cost of down-time... keeps equipment producing.



Simple test proves value of concave sides



Take a straight-sided V-belt (Fig. 2) and bend it. Feel the sidewalls of the belt bulge out as the belt bends. You see immediately that the bulging sides prevent uniform contact with the pulley (Fig. 2-A). Uneven contact causes faster wear...increases your drive replacement costs.

Let the cost-saving longer life of Gates Vulco Ropes contribute to *your* profits. Specify Gates Vulco Ropes—the V-belts with concave sides (U.S. Patent 1813698). The Gates Rubber Co., Denver, Colorado—*World's Largest Maker of V-belts*.

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

TPA-54A

GATES VULCO ROPE DRIVES



Here's how one manufacturer saves 20% on over-all manufacturing costs with SSW forged rings

By switching to Standard Steel forged steel rings a leading manufacturer of asphalt drying units saves 20% on over-all manufacturing costs. Used as rails on which 25-ft. long dryer drums rotate, these solid rings have replaced hot rolled steel bars which were formed into hoops and welded. It was found that these bars cracked under the severe load and pressure of the drums turning at 8 to 10 rpm.

Thanks to Standard Steel's high ductility and inherent uniform physical properties this problem no longer exists. The careful heat treating and tempering processes applied to these rings makes them highly resistant to impact . . . gives them longer-lasting life

and better performance in heavy-duty operations.

Follow the lead of other manufacturers and fabricators by improving your product and cutting costs with Standard Steel forgings. You'll profit by sending the coupon today for our new folder on forged weldless rings and flanges.

Dept. 8946, Standard Steel Works Division
Baldwin-Lima-Hamilton Corporation, Burnham, Pa.

Please send me Bulletin No. 10,000, "How Forged Weldless Rings
and Flanges Improve Your Product and Cut Your Costs."

Standard Steel Works Division
BALDWIN-LIMA-HAMILTON



Name Title

Company

Address

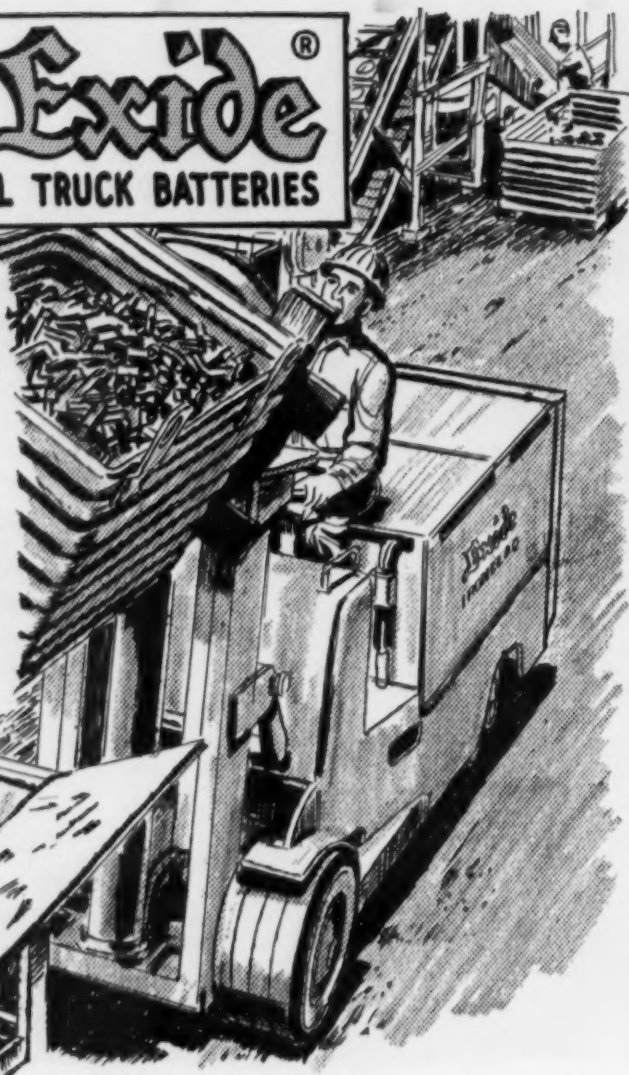
City Zone State

FACTS ABOUT Exide®

IRONCLAD® INDUSTRIAL TRUCK BATTERIES

**THE MORE YOU MOVE,
THE MORE YOU SAVE...
WITH EXIDES!**

EXIDE-POWERED ELECTRIC TRUCKS WORK FULL-SHIFT WITH NO UNSCHEDULED DOWN-TIME. TRUCK OPERATION IS SMOOTH, SPOTTING IS PRECISE-WITH NO NOISE OR FUMES. BUT BEST OF ALL, THE MORE MATERIALS YOU MOVE, THE MORE SHIFTS YOUR TRUCKS WORK, **THE MORE MONEY YOU SAVE-** CONSIDERING EXIDE'S LOWER COSTS TO OPERATE, MAINTAIN AND OWN! YOUR EXIDE ENGINEER HAS A SLIDE CHART BASED ON THOUSANDS OF HOURLY COSTS FOR POWERING INDUSTRIAL TRUCKS. ASK HIM TO PROVE THAT EXIDE-IRONCLADS ARE **YOUR BEST POWER BUY- AT ANY PRICE!**



TUBES OF POWER

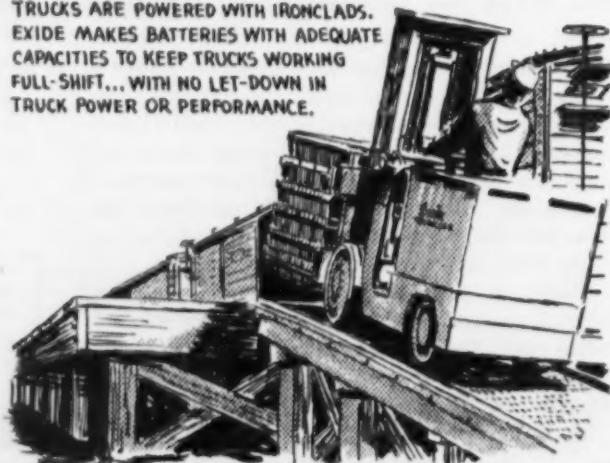


INSIDE EVERY IRONCLAD ARE SLOTTED TUBES THAT KEEP THE ACTIVE MATERIAL IN FIRM CONTACT WITH CONDUCTING GRIDS OF THE POSITIVE PLATES. THE ELECTROLYTE FLOWS EASILY THROUGH THESE NON-CORRODING SLOTS TO REACH MORE ACTIVE MATERIAL FASTER. RESULT: AN IRONCLAD DELIVERS GREATER POWER... FOR A LONGER TIME... AT LOWEST COST!

● PROTECTED SILVIUM CONDUCTING GRID
COMPRESSED ACTIVE MATERIAL
SLOTTED POLYETHYLENE RETAINER TUBE

NO MOVING JOB IMPOSSIBLE!

STEEP RAMPS, LONG HAULS, HEAVY LOADS... NO JOB IS IMPOSSIBLE WHEN ELECTRIC TRUCKS ARE POWERED WITH IRONCLADS. EXIDE MAKES BATTERIES WITH ADEQUATE CAPACITIES TO KEEP TRUCKS WORKING FULL-SHIFT... WITH NO LET-DOWN IN TRUCK POWER OR PERFORMANCE.



LET EXIDE HELP SOLVE YOUR INDUSTRIAL TRUCK BATTERY PROBLEMS. ① CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ② WRITE FOR FORM 1982, A MANUAL ON INSTALLING AND MAINTAINING MOTIVE POWER BATTERIES.

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

HYDRAULIC DANGER ZONE

Ordinary hydraulic fluid, escaping under pressure, can start a fire 40 ft. or more away from a broken line! Is your plant safe? Here's how one firm protects men and machines inside the danger zone...



PYDRAUL INCREASES SAFETY, EFFICIENCY OF NEW 1900° FURNACE

MIDWEST PIPING COMPANY, INC., ST. LOUIS, designed two pipe-bending furnaces with hydraulic doors to replace dangerous levers. But the system created a problem: If 800 psi hydraulic lines were ruptured by falling brick or pipe, escaping fluid would explode immediately in 1900° F. furnace! Midwest investigated, then solved the problem by installing fire-resistant Pydraul fluid in all hydraulic lines. Result: Operators are safer... danger of hydraulic fires is eliminated... excellent lubricity of Pydraul has increased operating efficiency.

Pydraul: Reg. U. S. Pat. Off.

FIRE RESISTANT

In tests and actual service, Pydraul has been discharged over molten metal, red-hot ingots, arcs, open flame and sparks without fluid igniting... even at temperatures up to 6000° F!

... AND A TOP-GRADE LUBRICANT

After 200-hr. Vickers Vane Pump Test, pump rotor operated on petroleum fluid showed weight loss of 2.9 grams due to wear. Rotor with Pydraul lost no weight—lost only 0.1 gram after 800 hrs! Timken Lubricant Test and Almen Wear Test also show Pydraul excellent in lubrication characteristics.

PLUS...

HIGH STABILITY
LOW MAKE-UP RATE
CONTAINS NO WATER
NON-CORROSIVE
RE-USABLE



FREE BOOKLET

Write now for new free booklet,
"PYDRAUL F-9."

Organic Chemicals Division,
MONSANTO CHEMICAL COMPANY, Box 478 F-8, St. Louis 1, Missouri.



Serving Industry... Which Serves Mankind

for
**HEARING
AIDS**

or
**RECORDING
HEADS**

or ANY MAGNETIC MATERIALS JOB...



Write for
your Copy

"MAGNETIC
MATERIALS"

This 32-page book contains valuable data on all Allegheny Ludlum magnetic materials, silicon steels and special electrical alloys. Illustrated in full color, includes essential information on properties, characteristics, applications, etc. Your copy gladly sent free.

ADDRESS DEPT. A-70

You can rely on core materials like the Allegheny 4750 components illustrated above, in your receivers, recording heads or microphone assemblies.

In fact, whether your equipment is small or large, the extra-broad line of A-L magnetic materials will solve your magnetic core problems. It includes all grades of silicon steel sheets or coil strip, as well as Allegheny Silectron (grain-oriented silicon steel), and a wide selection of high-permea-

bility alloys such as 4750, Mumetal, Permendur, etc.

Our service on these materials also includes complete facilities for the fabrication and heat treatment of laminations. (For users of electrical sheets and strip, our lamination know-how is a real bonus value!) Either way, we'll welcome the chance to serve you. Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.

STEELMAKERS to the Electrical Industry

Allegheny Ludlum

W&O 5335



The right file for the job plus the right service to make it count

When industry was younger, it gave less thought to files and filing. One file often did many jobs. Time, labor, types of material, character of operations, rejects and other filing-production factors were seldom calculated with today's close eye to costs.

Nicholson long ago recognized the growing importance of these cost factors in modern shop practices. Into the metallurgical laboratories, machine and tool shops, and assembly plants, went Nicholson research and design engineers—to study filing techniques and problems.

Special files were designed to accomplish specific results with maximum speed and utmost efficiency. Studies continued, and still do so—endlessly. Nicholson has become a consulting as well as a manufacturing organization whose entire attention is devoted to files and filing.

Made of Nicholson-specified steels under Nicholson-perfected processes, the distinctive files shown on the following page are sample expressions of Nicholson leadership in industrial helpfulness.

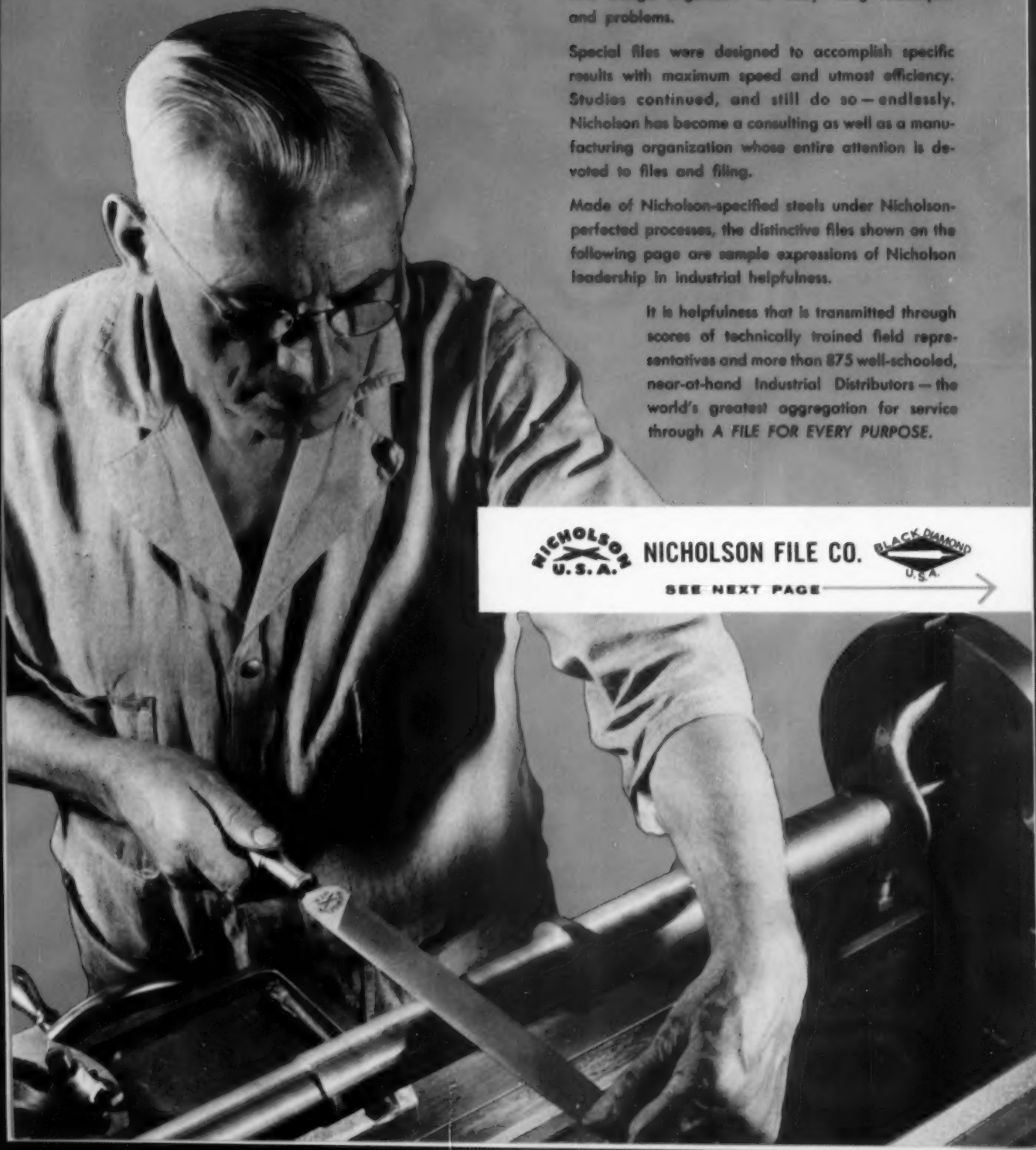
It is helpfulness that is transmitted through scores of technically trained field representatives and more than 875 well-schooled, near-at-hand Industrial Distributors—the world's greatest aggregation for service through A FILE FOR EVERY PURPOSE.



NICHOLSON FILE CO.



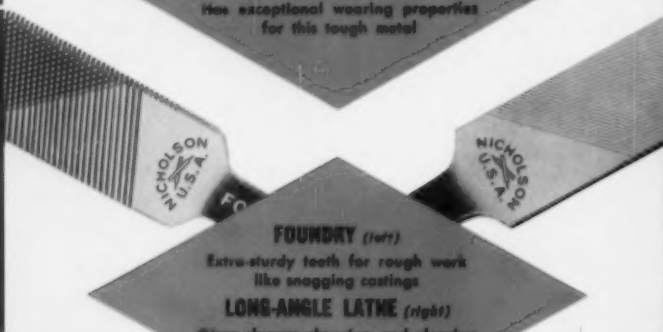
SEE NEXT PAGE →



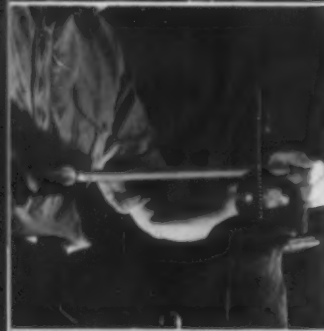
**See your Industrial Distributor for truly helpful service
in choosing and using the right file for the job**



ALUMINUM "A" (left)
Special teeth cut fast, finish well,
avoid clogging
STAINLESS STEEL (right)
Has exceptional wearing properties
for this tough metal



FOUNDRY (left)
Extra-sturdy teeth for rough work
like snagging castings
LONG-ANGLE LATHE (right)
Gives cleaner shearing and clearing
than ordinary files



BRASS (left)
Sharp, long-angle teeth eliminate
grooving and clogging
SWISS PATTERN (right)
Precise filing of dies, patterns, etc.
in many types and cuts



SHEAR TOOTH (left)
Cuts fast and smooth; ideal for
soft metals, plastics, wood
SUPER-SHEAR (right)
Smooths as it removes metal—
practically two files in one

**YOUR INDUSTRIAL DISTRIBUTOR IS A
GOOD MAN TO KNOW—CONSULT HIM
ABOUT THE RIGHT NICHOLSON OR
BLACK DIAMOND FILES FOR YOU**

NICHOLSON



NICHOLSON FILE COMPANY

23 Acacia Street, Providence 1, Rhode Island
(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)





you needn't be big to get attention at **CRUCIBLE**

Even baby-sized orders get special attention at Crucible . . . *because they're important to us.* The fact is, most of our warehouse business is devoted to serving the small steel user efficiently and economically.

That's why, when you need quality special steels in *any* quantity — or just some help with an application, you can be sure of a real welcome at Crucible. *We're big enough to serve you . . . small enough to want to.*

Stocks maintained of:

Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting and Plastic Die Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, HY-Tuf, AISI Alloy . . . Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE

WAREHOUSE SERVICE

Crucible Steel Company of America

General Sales Offices, Oliver Building, Pittsburgh, Pa. Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Dayton • Denver • Detroit • Houston • Indianapolis • Los Angeles • Milwaukee • Newark • New Haven • New York • Philadelphia • Pittsburgh • Providence • Rockford • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Toronto, Ont.

October 13, 1955

Exterior view of screw nut
machined from steel
bar stock:
Cost finished

\$5.60

each

Cutaway view of nut
redesigned as a cored,
Gray Iron casting:

Cost finished **90¢**
each



**This symbol assures
you the most for
your casting dollar**

Here's why it pays to call in one of the more than 500 leading foundries displaying the Society symbol:

- The most recent technical and business information is available to each member through the Society to help you design better products at lower cost.
- The use of sound cost accounting procedures is recommended and encouraged among Society member foundries, assuring full value for your casting dollar.
- Improved castings result from the advanced techniques and the high sense of responsibility of Society members.

83% saving with Gray Iron

A saving of over 80% on original cost by redesigning in Gray Iron! Also, longer life and improved operating characteristics are provided by the cast part.

This happens every day... someone decides to adopt Gray Iron and confirms its engineering advantages. Have you?

Call your nearest Society member foundry and the full facilities of this association will be available to help you. Or, write direct to Gray Iron Founders' Society, Inc., National City-E. 6th Bldg., Cleveland 14, Ohio, for helpful technical and business information.

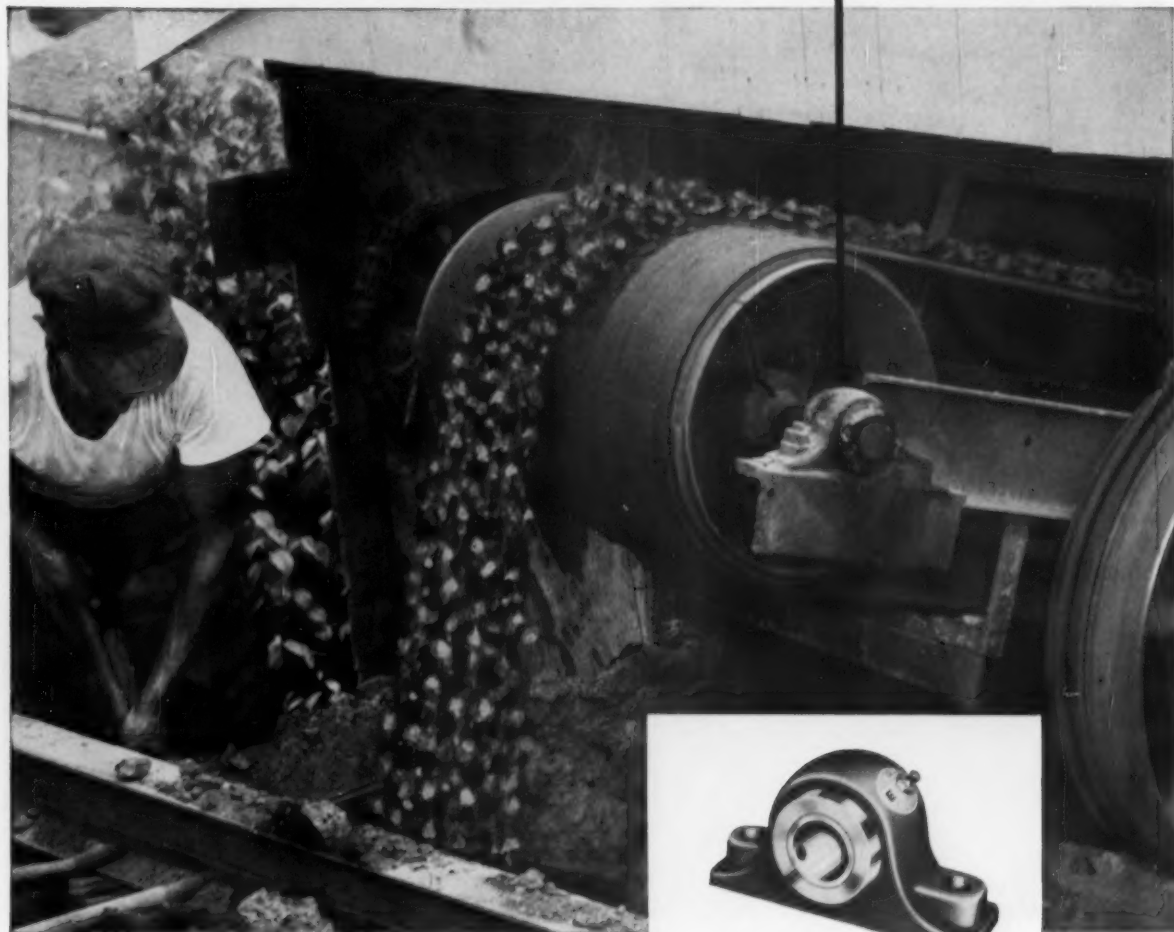
MAKE IT BETTER WITH GRAY IRON

GRAY IRON FOUNDERS' SOCIETY

**COMPLETELY ASSEMBLED
FACTORY ADJUSTED
PRE-LUBRICATED**

SEALED

*—ready to mount
on the shaft!*



DODGE-TIMKEN *America's Quality Pillow Block*

Extra measures are taken to build superior quality into Dodge-Timken Bearings; and extra precautions are taken to keep that quality *intact*—from the factory to distributor to you to your machines.

These bearings are sealed in manufacture—an integral part of Dodge-Timken design. Their inbuilt precision is protected *both on and off the shaft*. That is one reason why they easily deliver a minimum of 30,000 hours of service. Want evidence? Look around you. No other pillow block is so widely used on the nation's tough jobs. Dodge-Timken dependability has been proved in *millions* of installations.

There are 5 types of Dodge-Timken Pillow Blocks for all types of service, in shaft sizes from 1 3/4" to 10". Also Dodge-Timken Hanger Bearings, Flange Bearings, Take-ups.

DODGE MANUFACTURING CORPORATION, 800 Union St., Mishawaka, Indiana

DODGE

of Mishawaka, Ind.



CALL THE TRANSMISSIONER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.



This Point is Not Exaggerated

Spare the rod (quality-wise), and you may spoil the brain-child of the product designer.

This point is well taken by many manufacturers who fabricate Brass Rod into component parts for pens and pencils, clocks, lamps, electric and plumbing fixtures, screw machine parts, and what have you. And that's why so many of these manufacturers are what you might call "confirmed addicts" of Bristol Brass Rod.

In pencils, for instance, Bristol "pencil point rod" makes it possible to drill a more concentric hole, with much better uniformity. And all shipments of *all* Bristol Brass Rod have the same clean surface, uniform gage, and high machinability. (You can say that *again*, about Bristol Brass strip, coil and wire.)

Try it out for yourself. Bristol Sales Engineering Service is airborne . . . at your service any time you say.

And now . . . BRASS FORGINGS, too . . .

The Bristol Brass Corporation announces the acquisition of Accurate Brass Company, 73rd Ave. & 98th St., Brooklyn 27, N.Y.

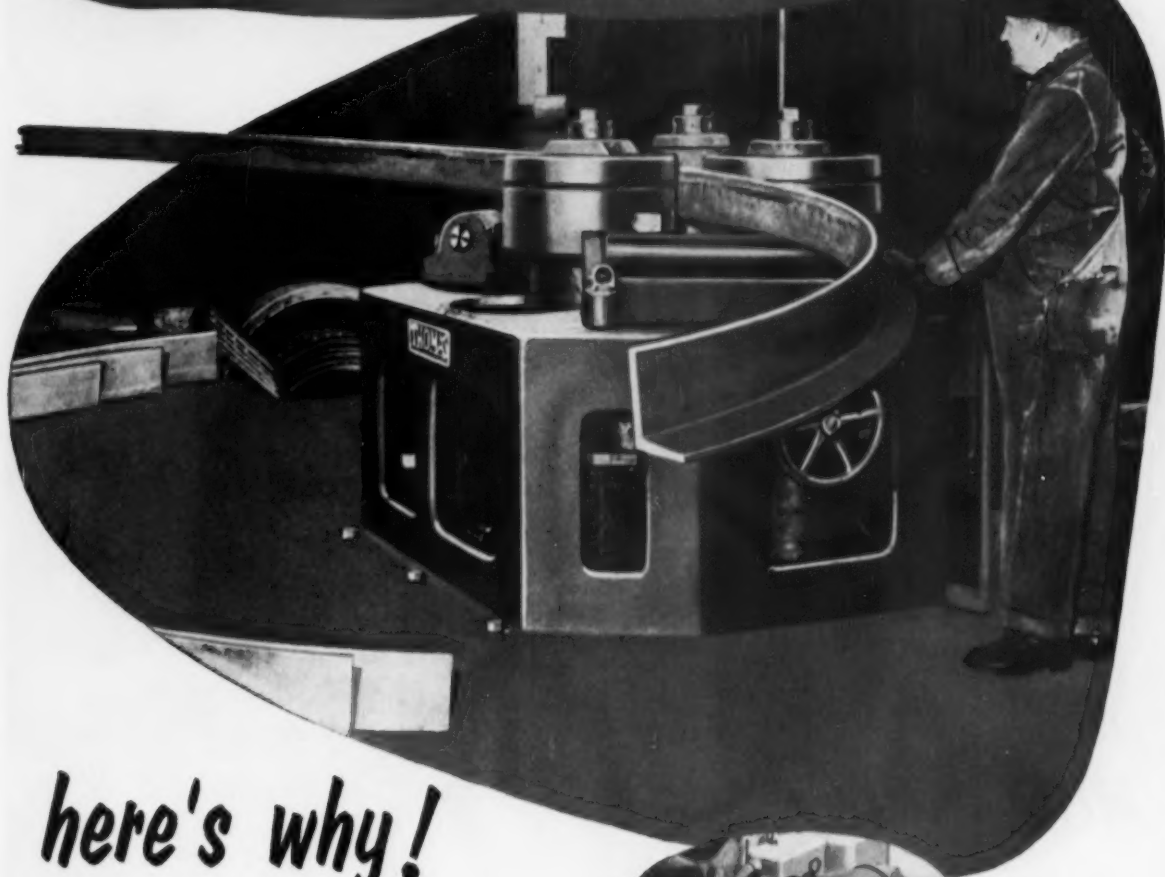
"How do you know it can't be forged?"

THE BRISTOL BRASS CORPORATION

has been making Brass strip, rod and wire here in Bristol, Connecticut since 1850, and has offices and warehouses in Albany, Boston, Buffalo, Chicago, Cleveland, Detroit, Milwaukee, New York, Philadelphia, Providence, Rochester, Syracuse, The Bristol Brass Corporation of California, 1217 East 6th St., Los Angeles 21. The Bristol Brass Corporation of Ohio, 1607 Broadway, Dayton.

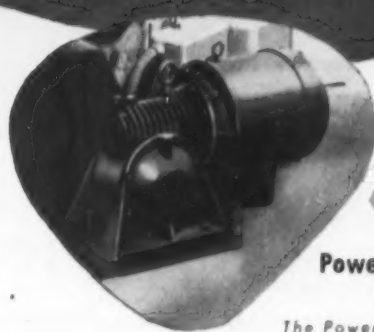
"Bristol-Fashion"
Means Brass at its Best

*the trend is to THOMAS ...
for ANGLE BENDERS too!*



here's why!

- 1** All-steel welded construction . . maximum strength with minimum floor-space required.
- 2** Furnished complete for leg-out or leg-in angle bending . . no extras to buy!
- 3** Quick roll adjustment for width of slot . . quicker change-over.
- 4** Special roll combinations available for beams, channels, flats, pipe, etc.
- 5** Usual Thomas ruggedness and dependability, as found in all Thomas metal-working machinery.



**Power Adjustment
Optional**

The Power Adjustment of the Movable Roll Shaft is an optional extra. It is used for quickly changing roll centers for different diameters. Machines also may be equipped with Electric Brake on the main driving motor for greater accuracy of bending.

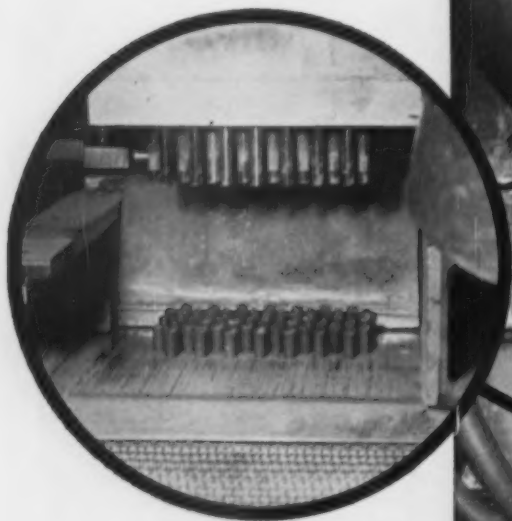
● Bulletin 314-A contains complete specifications and capacities covering the four sizes and two styles. Write.

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

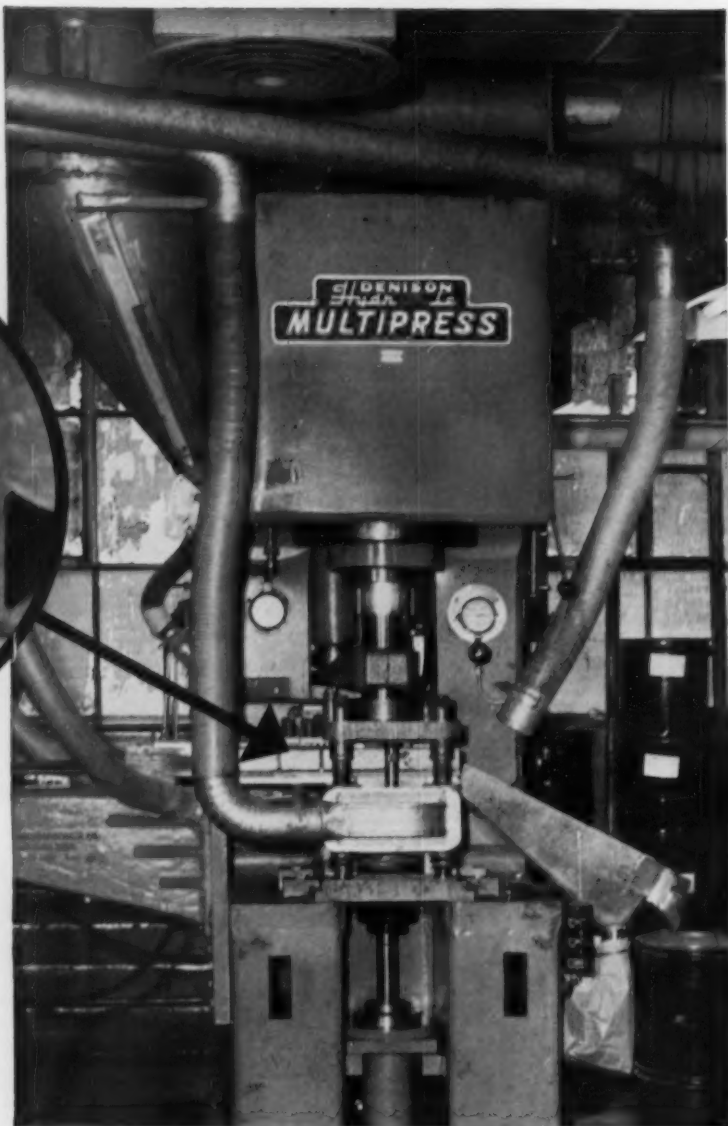
October 13, 1955

Compacts
40,000 tablets
an hour



...automatically
with **DENISON**
MULTIPRESS®

an idea that simplifies
many compaction jobs
... to save you money



52 tablets compacted with every ram cycle add up to 40,000 tablets an hour. That's what's turned out on a Denison hydraulic Multipress at this leading pharmaceutical company.

The entire operation is automatic. Results are uniform, cost is low.

Hoppers feed powder to a Denison Shuttle Feed Accessory that loads a multiple-cavity die. Two rapid, precision pressure controlled strokes of the Multipress ram compact the powder into tablets.

Many operations of compacting powdered materials can now be done faster, simpler . . . at substantial reductions in cost with Denison hydraulic Multipress and accessory equipment. Have a Denison Engineer study your operations and demonstrate how. Write.

**THE
DENISON ENGINEERING COMPANY**

1242 Dublin Road • Columbus 16, Ohio

A Subsidiary of American Brake Shoe Co.

52 TABLETS PER CYCLE coming off multiple-cavity die after compaction on Denison hydraulic Multipress. Tablets come down chute, are collected and coated.



**IF YOU ARE STILL
LOSING 20 MAN-HOURS
DRIVING KEYS...**



THE NEW ERIE KEY DRIVER

lets you drive keys safely in one man-hour

STOP DRIVING A SPIKE WITH A TACK HAMMER!

Now, when driving die and sow block keys in forge hammers, the new Erie Key Driver will do with *two* men in 15 minutes what used to take 5 men (don't forget the crane operator) several hours! Let Erie Foundry Co. show you how to save maintenance man-hours, eliminate wasteful down time, reduce accidents.

THE NEW ERIE KEY DRIVER IS SAFE

There's no danger of ram end-swing, no glancing blows, minimum mushrooming of keys. Every Erie Key Driver blow is true. One user says, "The incidence of personal injury and property damage has been reduced to a relatively negligible nature by using the very efficient Erie Key Driver."

*Name furnished upon request.

Write for Bulletin No. 356 today

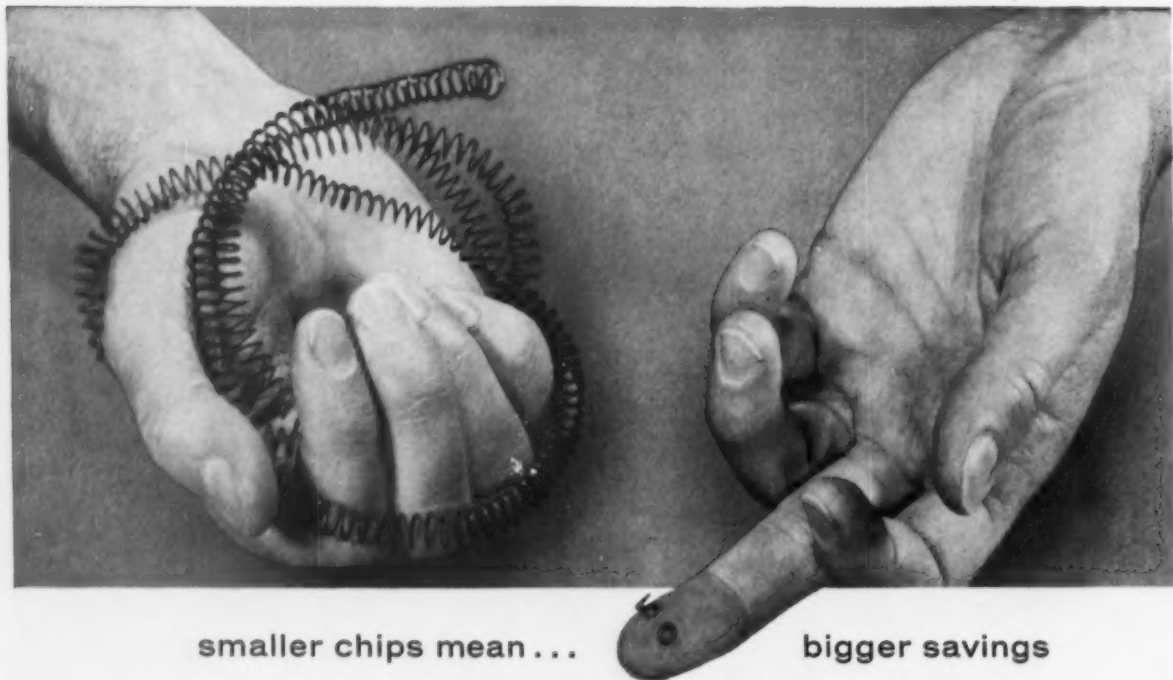
ERIE FOUNDRY CO. ERIE, PA.

THE GREATEST NAME IN FORGE HAMMERS



October 13, 1955

55



smaller chips mean ...

bigger savings

Cut costs with RYCUT steels!

Three new Ryerson leaded alloys

These short, fast-breaking chips have real meaning to cost-conscious purchasing and production men. In an ever-increasing number of shops, small chips like these mean that the switch has been made to Rycut steels. They mean that tools are turning faster—that production is up as much as 200%.

The secret of Rycut's machining speed is a minute quantity of lead, finely dispersed throughout the steel. This acts as a lubricant between tool and steel. The results are revolutionizing machine shop practice:

- Up to 200% more parts can be produced per machine hour!
- Tool life is lengthened as much as 300%!
- Finish is improved!

There's a Rycut leaded alloy for every application. Use RYCUT 20 when you need a

carburizing alloy; RYCUT 40 for .40 carbon alloy applications; and RYCUT 50 for .50 carbon alloy uses. Every one is a cost-cutter.

Figure how much this increased production and longer tool life would lower costs in YOUR shop—and raise your profits! Call your nearby Ryerson plant today . . . large stocks assure you of quick shipment.

See RYCUT 40 machined
at the National Metal Exposition, Booth 931

See tool life lengthened 300% in machining demonstration of RYCUT 40 vs. AISI 4140.

Flame cutting also demonstrated—Watch the actual burning of intricate steel shapes with electric-eye equipment.

RYERSON STEEL

In stock: Bars, structurals, plates, sheets, tubing, alloy and stainless steel, reinforcing bars, machinery & tools, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The Iron Age Newsfront

Aluminum Pinch To Continue

Forecasts of aluminum supply and demand for 1956 show that the tight supply situation will not change. Unofficial government estimates place the total supply for next year at about 4,702,000,000 lb. If no stockpiling and exports are permitted, this would mean an oversupply of only 577 million lb. But, there will be some stockpiling—and exports will not be embargoed—so the scramble for aluminum will continue.

No Immediate Challenge

A new contender, the free-piston engine, has seriously entered the automotive power race. Most engineers agree that it will be at least five years before either the free-piston or gas turbine engine strongly challenges the reciprocating engine which, incidentally, is undergoing constant improvement.

Locomotive Production Climbs Upward

Orders for diesel-electric and electric locomotives are coming in at a faster clip than at any time during the last two-year period. As of the beginning of September, contracts were on hand for 704 units. One large producer reports an upswing of 33 pct over the same six-month period last year. At least 3000 to 4000 new units will be needed within the next few years to complete dieselization of the nation's railroads.

Another Boost For Helicopters

The recent performance of helicopters in the Tampico, Mexico flood disaster again pointed up the effectiveness of the rotor birds under make-shift landing conditions. The past growth of the industry has been tied in closely with such public demonstrations of usefulness. Piasecki Helicopter Corp., which had 15 craft in the Tampico operation, is adapting its H-21 model for commercial use.

Permanent Magnet Uses Grow

Permanent magnets used in automation devices are expected to find their way into more appli-

cations in the metalworking field. Magnetic sheet fanners tied in with small-diameter permanent magnetic rolls are now being tried for feeding large sheets into processing equipment. Method speeds handling; cuts operator fatigue.

Consumable Electrodes For Vacuum Melting

The latest modification of vacuum melting the superalloys is the use of consumable electrodes in an arc furnace setup. The electrodes are cast to a predetermined composition. Advantages claimed for the process include improved solidification rate, further reduction of inclusion count, increased capacity and lower equipment costs.

Meteorites Scrutinized More Carefully

Governmental interest is being attracted to the metallurgy of meteorites. It is thought that these metallic bodies—whisked to earth from outer space—may provide important clues for high-temperature alloy development. Most of all, they may uncover nature's answers to the operational problems associated with guided missiles.

Barrel Tumbling Speeds Flood Recovery

Barrel tumbling is proving a fast, economical and efficient way to recondition inventories of small finished parts damaged by floods in New England this past summer. An extra bonus is the elimination of manual handling of the parts which often are covered by septic mud and slime.

West Coast Scrap Market Tightens

Export scrap shipments from the West Coast have completely reversed the market there from what it was a year ago. It may hit a million tons this year, largely to Japan. The Japanese are drawing about half their requirements from the West Coast with local mills bidding for available inventories. Many fringe area yards have stored it for more than a year and now find it economically feasible to ship it out. In many cases, the hauls are 700 miles.

HOW **CMP** RESTRICTED SPECIFICATION COLD ROLLED STRIP STEEL CUTS MATERIAL AND END-PRODUCT COSTS...

Putting a stop to troubles with cold rolled strip steel has long been the specialized business of CMP.

By working to restricted specifications for size, characteristics and finish, CMP precision rolling and processing has helped in many ways to reduce slow downs in production with flat rolled steel.

The danger of not having steel with the "working qualities" that will keep up with today's high speed automatic machines can be eliminated. In many cases a CMP restricted specification strip has simplified tooling and stepped up machine speeds 25% or more.

And when the free flow of CMP strip is moving through your equipment without difficulty you'll know why your end-product costs are at the right level — why it pays to always check CMP for the right specification wherever cold rolled strip steel is needed. Your inquiry is invited.

CMP
WHERE YOU
CAN GET
SPECIFIC SPECS.
FOR
SPECIFIC JOBS

LOW CARBON
HIGH CARBON
Annealed or Tempered
STAINLESS
ALLOY
ELECTRO ZINC COATED

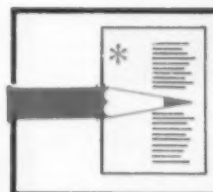


the Cold Metal Products co.

GENERAL OFFICES: YOUNGSTOWN 1, OHIO

PLANTS: YOUNGSTOWN, OHIO AND INDIANAPOLIS, IND.
SALES OFFICES: New York • Cleveland • Detroit • Indianapolis
Chicago • Los Angeles • San Francisco

See us at the
METAL SHOW
Booth 338
Philadelphia
Convention Hall
October 17-21



NEWS
SECTION
SPECIAL
REPORT

A New Seacoast Gets Ready

St. Lawrence Seaway is well under construction . . . Power and commerce create new industrial frontier . . . Labrador ore will replace dwindling Mesabi—By R. D. Raddant.



♦ **MIGHTY** St. Lawrence River, harnessed for power and deepened for commerce, will open a new U. S. industrial seacoast.

In its first year, the St. Lawrence Seaway is expected to carry 36,500 tons of commerce through its channels. Its new power development will generate 1,400,000 kw for use in New York and Ontario.

Meanwhile, Great Lakes cities, which will become potential world ports when the first seagoing freighter emerges from the new Long Sault Locks, are preparing with varying degrees of intensity for their new role.

Need Preparation

It's becoming more and more obvious that the mere opening of the Seaway is not automatically going to create thriving ports and new industry. Without preparation, the vast potential of its commerce and industry may not be realized by all cities. Some will get their full share, some more, and others will be bypassed.

The potential is there if fully utilized. Even on its present

canals and channels, limiting St. Lawrence vessels to 250 ft in length and 14 ft draft, 14 foreign flag lines are offering Great Lakes-Overseas service. Total tonnage this year will reach about 10 million.

In its first full year of operation, it is expected that traffic will reach 36,500 tons of U. S. and Canada grain, iron ore, petroleum, coal, woodpulp, nonferrous ores, and general cargo. By 1970 annual traffic should reach more than 52 million tons.

Tied in with the Seaway with its opening of new trade potential is power development. Canada has long utilized St. Lawrence while, with one exception of private industry, it has been neglected on the U. S. side.

But the new power development will generate 1,400,000 kw (compared with the Grand Coulee Dam's 1,974,000 kw) and is expected to draw industry to northern New York state, which has lagged in industrial development.

What will all this cost? Practically nothing to the taxpayers. Financing of both power and Seaway work will be done by revenue bonds.

Share Costs

In the Seaway construction bill, Congress provided a limit of \$105 million, with the proviso that tolls be charged for its use to make it self liquidating. Revenue bonds are issued by the St. Lawrence Seaway Development Corp.

The Long Sault Dam is financed by the New York Power Authority and the Hydro-electric Power Commission of Ontario. Costs and

power are shared equally. Cost of the power project is estimated at \$600 million, New York's share financed by 30-year bonds issued by the Authority.

The power and Seaway developments, while interlocked in the broad scope of the project, are actually independent and independently financed.

In addition to the obvious benefits of commerce and power, there is another important factor behind the Seaway—national security. With the vast iron ore of Minnesota's Mesabi range facing eventual depletion, it is necessary to bring in foreign ore to the nation's Midwest steelmaking capacity on the Great Lakes.

A deep water route is necessary



COFFERDAM holds back river as work starts on St. Lawrence power plant. Dams will change river's course many times.

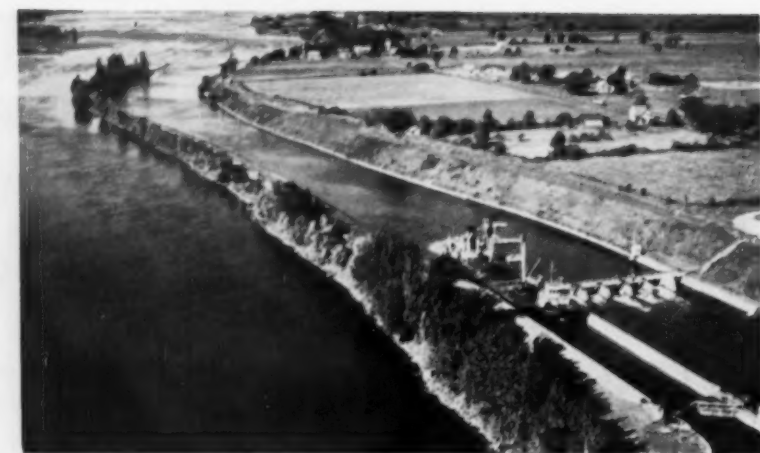
SPECIAL REPORT

in order to utilize the vast Labrador ore sources being developed at a cost of \$250 million by the Iron Ore Company of Canada, a joint undertaking of steel companies with capacity located on the Great Lakes. The Seaway will also permit inland steel mills to use rich ores from Venezuela or Liberia, which must now be transshipped or carried in the small vessels that can go through the present small canal.

Some Wait

As the Seaway work progresses, many Great Lakes cities are making elaborate plans to take advantage of the waterway, which will be adequate to carry regular oceangoing freighters into Lakes cities.

On the other hand, some are following a "wait and see" policy, believing that facilities will be developed as the need arises. Others are restricted from immediate action for varying reasons, principal one being that available waterfront is already fully taken up,



SMALL FREIGHTERS like these passing through the Cornwell Locks at the International Rapids section are limited to 2500 tons. Despite small size, annual tonnage using the channel will reach 10 million tons.

leaving little for port development.

For cities west of Toledo to take advantage of the Seaway, present channels in the Detroit and St. Clair rivers will have to be deepened. This work is not authorized in the Seaway appropriation, but is expected to be done before the Seaway is completed.

Port activity is not restricted to the great industrial centers.

Some of the smaller cities are working hard to take advantage of their positions on the new "seacoast."

What They Are Doing

This is what Seaway cities are doing and how they believe they will be affected by its development:

Milwaukee . . . Already has best heavy crane facilities on the Lakes and is making big plans to be-

IN 1959 SHIPS LIKE THESE:



BULK CARRIERS:

710 FT LENGTH
75 FT BEAM
24 FT DRAFT
25,000 TON CAPACITY



GENERAL CARGO:

500 FT LENGTH
73 FT BEAM
25 FT DRAFT
8,000 TON CAPACITY

Through this Channel
27 FT DEPTH 430 FT WIDTH
80 X 860 FT LOCKS

WILL CARRY

	TONS
GRAIN	12,100,000
IRON ORE	10,500,000
PETROLEUM	2,300,000
COAL	3,700,000
WOOD PULP	700,000
NONFERROUS ORES	800,000
GENERAL CARGO	6,400,000

TOTAL	36,500,000
ESTIMATED -1970	52,000,000

Note: 1955 Ships like these



250 ft Length, 43 ft Beam,
14 ft Draft, 2500 ton Capacity
will carry this year 10,000,000 Tons

come Lake Michigan's big port. This Wisconsin city already has nearly 200 overseas sailings a year, expects many more on completion of the Seaway.

Chicago . . . Big project is the construction of a modern harbor and port terminal at Lake Calumet, assured by 1957 with the recent sale of \$24 million bonds. This will cover the initial stage of Lake Calumet harbor development. It calls for a 70-acre basin with 5770 feet of dock backed up by 125 acres on which port terminal facilities will be located.

A total of 2200 acres of lake and riparian areas will be developed. Two grain elevators of 6.5 million bushel capacity each will take the largest bite from the initial expenditure. Dredging, transit sheds, warehouse and rail and truck facilities are other major construction jobs. A mobile crane capable of handling 100 tons is planned. Revenue estimates from leases and other harbor operations range from \$1 million net in 1957 to \$1.5 million by 1970.

In recent years, Chicago accounted for about one third of Great Lakes-Overseas tonnage total, substantially more than any other Great Lakes city.

Savings to be obtained from Seaway shipping to North European ports from Chicago are estimated at 17 pct on automobiles, 23 pct on small machinery, 43 pct on agricultural implements, 20 pct on road building machinery.

Detroit . . . Already handling upwards of 25 million tons of bulk cargo a year, facilities are considered adequate for additional bulk tonnage brought about by the Seaway completion. Big problem is construction of adequate facilities to handle packaged cargo. A survey is currently being made to determine needs for 1960. Port of Detroit Commission is encouraging development by private enterprise of docks and warehouses. A major problem is the fact that waterfront is almost entirely developed by heavy industry with little available for port facilities. If development is not undertaken by private business, the Port may build its own facilities or arrange to have them constructed



CONSTRUCTION is started at Robinson Bay Lock site. This will mark the lower entrance to the Long Sault canal around International Rapids. Ocean-going freighters of regular size will pass through locks.



BEHIND cofferdam, construction crews are working on permanent Long Sault Dam, which will control river level and divert river into the main channel to the Barnhart Island Dam where power plant is located.

Cleveland . . . An \$8 million dollar bond issue is on the ballot to finance pier construction, harbor deepening, and lakefront airport improvements, if approved. One survey estimates that general cargo will increase from 40,000 tons a year to 800,000 in the first year of full Seaway operation. However, some Cleveland authorities believe that the city already has adequate dock facilities. This city stands to benefit greatly through imports of Labrador ore to its intensive steelmaking facilities.

Toledo . . . An excellent harbor potential in the Maumee River plus good bulk dock facilities already constructed will aid Toledo.

This city has set up a port authority, is going to go all out for bulk cargo.

Ashtabula, Ohio . . . A \$1 million dock is almost completed by Nelson J. Pinney, a private contractor. The area's chemical industry will be the major beneficiary.

Buffalo . . . This will be the closest large American port to the new Seaway. Of the country's major steelmaking centers, it will be the closest to the Labrador deposits.

To prepare for the Seaway, Buffalo has appointed a consultant and has spearheaded a drive to form Niagara Frontier Port Authority. Master plan for improve-

SPECIAL REPORT

ment of the port calls for expenditures of between \$26,900,000 and \$31,900,000. Plans call for construction of a \$5,500,000 new pier and bulk handling plant and general cargo terminal in the south end of the harbor. Also on drawing boards are two small boat harbors, construction of several other piers and addition of 12 winter mooring berths. A \$50,000 survey also indicates that Buffalo can bring 13 new industries to the region if the Seaway is exploited properly.

Oswego, New York . . . This is an example of a small city that looks to the Seaway to bring prosperous industry as well as shipping. It is also the best example of constructive effort by a united community. Although a small city, it has retained a full time port director, the highest paid city official. It is on the terminus of the New York State Barge Canal. If neighboring industrial cities to the south are going to use the Seaway, they will have to use the Port of Oswego. It is conducting a survey to evaluate the commerce that is available for movement through the port, to determine type of industry that could best locate in the area, and to design facilities for attraction and

maintenance of these industries. An active promotional campaign is being conducted and the city has asked for title to the Canal terminal facilities.

Northern New York State . . . The Massena area will be best able to utilize the power development. Already in Massena is the large Aluminum Co. of America plant with its own power facilities. The company will be forced to dismantle its power facilities, but has entered into a 38-year agreement with the Power Authority. However, Alcoa will have to spend some \$25 million in conversion. The company has also announced an expansion of its fabricating facilities at Massena.

This area, with the advantage of available power, is remote from highly populated market areas for consumer goods. Therefore, the industry to be attracted is likely to be a basic industry that requires power, but is not dependent on nearby markets. One of the big chemical companies is said to have purchased or taken options on property in the area.

Work Under Way

While Great Lakes cities are planning and waiting, work on the

mammoth project is well underway on both sides of the St. Lawrence. Tracing the river upstream from its mouth, first work is being done by the Canadian government.

Canada is constructing canals and four locks in the Soulanges and Lachine Rapids sections near Montreal. Upstream is the International Rapids section where the joint power installation is being constructed by the U. S. and Canada and where the Corps of Engineers is constructing the locks and Long Sault Canal around the International Rapids.

In this area, engineers are playing around with the mighty river with a series of cofferdams, as if it were a tiny trickle, changing the course from one channel to another and back again while dams and locks are being constructed.

Some of the incidental work required for the principal projects are major undertakings in themselves. A tunnel has been constructed under the present Canadian canal just for equipment to be brought in and out. Two temporary bridges have been built at a cost of millions. A railroad line has been extended, complete with a ten-track yard, for bringing in construction materials and equipment. It will be dismantled on completion of the project.

Temporary facilities known as the Massena Intake, to permit flow of water to Alcoa's power plant until the St. Lawrence facilities are completed, will cost several million.

Behind the power dam at the east end of Barnhart Island will stretch Lake St. Lawrence, a body 30 miles long and up to five miles wide. It will provide a head of about 87 ft of water for driving 32 huge turbine-generator units, 16 on each side of the boundary. Because there is no natural basin, dikes will have to be constructed miles upstream to contain the water.

There are some 2400 men at work in the 35-mile area. This figure will reach nearly 7000.

The U. S. portion of the Seaway includes the Long Sault Canal and also deepening the navigation channel in the river downstream from the canal and upstream in the Thousand Islands section.



ALCOA'S Massena plant will use St. Lawrence power. But own power plant in foreground will be bypassed. Conversion to new source will cost millions of dollars. Plant is scheduled for new expansion.

Credit Buying Is A Political Issue

Consumer credit skyrockets to new high . . . Situation expected to be issue in '56 election campaign . . . Implications are good or bad depending on who you listen to—By N. R. Regeimbal.

♦ CREDIT-HAPPY consumers are engaged in the biggest, nothing-down, almost-nothing-a-week orgy in the nation's history. It's provoking mixed reactions, ranging from fearful prognostications of economic chaos to reassuring analyses that the whole situation is necessary and indeed a fine thing.

Just what effect the present credit spree will have on the long-range economic health of the country is a puzzle no one can answer with certainty—it's never occurred before in exactly the same manner.

Politics normally is concerned with the differing estimates of whether credit is overexpanded, will soon be overexpanded, or is entirely healthy. In recent months, credit has become an even more important tool in politics, and will further increase in importance as the 1956 elections approach.

The facts . . . Buoyed mainly by a new splurge of automobile buying, total consumer credit in August skyrocketed by \$740 million to a record high of \$33.636 billion. This does not include mortgage loans which increased about \$1 billion per month this year and now total more than \$80 billion.

Automobile loans in August alone added \$509 million to the swelling debt. Americans now owe \$13.547 billion on the cars they drive. Without this credit, most experts agree, the automobile industry would not have been able to sell its estimated 6.5 million new cars this year, and steel and other metals industries wouldn't be enjoying such good sales. August was the fourth straight month that consumer borrowing hit a new high.

Back in 1945, total installment and mortgage debt in this country amounted to only \$24 billion, compared with a total above \$113 billion now.

Consumers aren't the only group living off next year's income. Since 1945, business borrowing has shot up from \$116 billion to about \$250 billion.

What does it mean? . . . It depends on who you listen to.

Dr. Jules Backman, professor of economics at New York University, says the high level of personal debt threatens the nation's future prosperity. Even though consumers may be in a position to carry the debt and to repay it in full, there may still be adverse effects on future business, he says. If families spend beyond their income they stimulate the

economy now, but eventually they will have to spend less than their income to repay the debts and the stimulus is lost, he continues.

Nonsense, says A. L. Trotta, manager of the credit division of the National Retail Dry Goods Association (department and specialty stores). The volume of time sales in relation to consumer income has actually declined over the past 16 years, he says. And not enough emphasis is being placed on the quality of the present consumer debt, he adds. In 1939, credit debt equalled 2.3 pct of the total national disposable income, and is only 2.1 pct now, he adds.

"Mass production without mass sales would be impossible and mass sales without mass credit would be a similar improbability," adds Theodore H. Silbert, president of Standard Factors Corp.

Installment Credit

Where it comes from, where it goes:

Installment Credit—July, 1955
(millions)

Auto Paper	\$13,083
Other Consumer	
Goods	5,676
Repair and	
Modernization	1,570
Personal Loans	5,192

Source: U. S. Dept. of Commerce

Financers

Commercial Banks	\$9,656
Sales Finance	
Companies	8,087
Credit Unions	1,458
Other Financial Units	2,779
Department Stores	1,155
Furniture Stores	856
Auto Dealers	501
Other Retail	984

TOTAL—\$25,376,000,000

MEDICAL: Is Your Setup Adequate?

Industrial doctor's group offers free consultation-recommendation service . . . Set standards to evaluate current medical operation . . . Costs usually less than generally expected—By G. G. Carr.

♦ PROVIDING ADEQUATE medical service has been developing as a management headache for some time, for companies of all sizes. Executives realize the value of safeguarding workers' health; unions are pressing demands for in-plant services; and insurance companies point to the possibility of lower liability and compensation rates.

To most executives the problem is two-fold. Initially, what is proper and adequate medical service? To a 75-man machine shop a full-time doctor would probably be an extravagance; but to a vast industrial organization with employees all over the globe, a complete department of tropical medicine would not be unusual. Secondly, what does it cost?

There is no rigid standard for industrial programs, but there is available, without cost, evaluation

of your company's medical facilities from a leading professional organization. The cost of an approved program is very often less than generally expected.

Occupational Health Institute, sponsored by Industrial Medical Association, provides free consulting for evaluation service to company medical departments. And it is prepared to make some down-to-earth recommendations on the cost end.

Certification

The institute, a non-profit educational group, is the official association of all doctors concerned with medicine as applied to industry. It furnishes professional guidance to both doctors and physicians, and has set standards to certify and evaluate industrial medical units.

The institute's requirements for

certification are adapted to fit companies that range from few as 50 employees to as many as 25,000. These published requirements are a useful checklist for any company interested in appraising its own medical program, although the institute emphasizes that it grants formal certification only after individual evaluation of each company, plant or subsidiary unit.

While the requirements at first glance may appear formidable, the institute claims that such a program may be carried out for between \$18 and \$32 per employee per year. Location and size of plant, plus nature of work performed account for much of the spread, with larger firms trending to the low side of the range.

The institute admits that it is difficult to reduce a health program to profit and loss figures, but cites the following as an example of the cost of not having such a program:

Loss Expectancy

The National Association of Manufacturers reports that a 500-man plant has an expectancy each year of 335 days of disability due to industrial diseases and accidents, and 4500 days due to non-occupational illness and injury—a total of 4835 man-days lost per year.

Translated into money, this represents an average wage loss to employees of \$73,782 a year, based on \$15.26 daily wage (Bureau of Labor Statistics wage index, May 1955). This loss varies with the number of employees, so that in a 100-man plant the loss is about \$14,756, and in a 10,000-man factory almost \$1.5 million. The relation of such losses to production and hence profits is obvious.

Aim For These Standards

■ Occupational Health Institute requires that a company medical service should, to be eligible for certification as an approved program, meet the following standards:

1. Have a stated medical policy.
2. Perform preplacement medical examinations.
3. Periodically examine all workers exposed to industrial hazards.
4. Provide voluntary periodic physical examinations for all workers.
5. Refer workers to competent specialists when necessary.
6. Observe proper sanitation, safety and hygiene procedures.
7. Assign a responsible executive to supervise the program.
8. Maintain a properly equipped dispensary or first aid station.
9. Utilize only properly qualified medical personnel.
10. Keep adequate and confidential medical records.

■ Larger firms (2500 to 25,000 employees) should also provide one full-time doctor or equivalent for each 2500 employees, maintain facilities for examinations on company premises, and record job descriptions.

FLAT TOP: Our \$200 Million Punch

U.S.S. Saratoga world's most powerful warship . . . Features modern first-of-a-kind equipment . . . Greater speed, longer cruising range, more accurate firepower biggest advances—By F. J. Starin.

◆ THE UNITED STATES government has just spent over \$200 million on a project, CVA-60, which it hopes will never have to go into action. CVA-60 is better known as the aircraft carrier U.S.S. Saratoga since her christening Oct. 8. This 60,000-ton vessel is the most powerful warship afloat and a good example of the money and effort being expended for national defense.

The primary aim of her designers was safety, extra speed, explosion resistance and long endurance range. The result of their efforts is described by the Navy as a "steel frame box." Over 115 million lb of steel went into construction of the hull and flight deck in addition to over 473 miles of cable.

Actually, the biggest advantage of the new ship is the quota of newly designed, first-of-a-kind equipment she carries. Her propulsion equipment will develop over 200,000 horsepower, more than any other ship ever built, enough to drive the vessel at a rate in excess of 30 knots (34 land mph). And yet it is smaller and much more compact than its less powerful predecessors carry.

The key, according to General Electric and Naval engineers who cooperated in the design, is the use of considerably higher steam temperature and pressure in the four cross-compound turbines.

Ultra Radio

Supplying power for servicing the jet aircraft will be units designed by General Electric, rated at 600 kws, 400 cycles, operating at a speed of 12,000 rpm. Newly designed, the turbine is directly connected to the generator without intermediate gear reduction,



TWIN anchors necessary to make the U.S.S. Saratoga hold fast weigh a total 60 tons and are suspended on chains weighing 360 lb per link.

with both parts mounted on the condenser which forms the base for the set. This package of power is lighter and more compact, encompasses many new engineering - mechanical developments and is easier to install and handle.

Communications system was developed by Federal Telecommunication Laboratories, a division of International Telephone and Telegraph Corp. The backbone is a long range, ultra-high frequency radio system with an effective range 150 pct greater than previously used equipment, able to operate at the unusually high altitudes flown by the carrier's jets.

The defensive firepower of the Saratoga boasts the most modern automatic anti - aircraft gun mounts yet developed by the Navy. Electronic equipment is able to transfer radar data to the guns, pinpoint the target and fire, while

automatically correcting roll and pitch of the ship and wind speed.

Biggest Of All

Assembling all of this modern and massive equipment turned out to be a major administrative job. Some 675 contracts were allotted. Three hundred and fifty major vendors and manufacturers provided machinery and components. Over 2000 railroad cars rolled into the shipyards from all over the country with material. More than 14,000 working drawings kept draftsmen, engineers and naval architects busy for three years. For over 20 months four miles of blueprints were required.

Naval records list this as the sixth ship to bear the name Saratoga, dating from 1780. But the latest and greatest is, as far as can be determined, at least equal in cost and probably firepower to the total of the other five.

L. S. Hamaker

He Looks Into The Future

Technology may bring smaller steel units to serve specific needs . . . Titanium's future in engineering and technical products . . . Powder metallurgy outlook discussed.

Q. What do you look for in the way of organizational changes in steel during the next 25 years?

A. Technological progress may make possible smaller economic units than the present "million ton minimum," which would mean more but smaller plants to serve specific needs. This does not mean the end of the big integrated operation—it is a supplement to it. There should also be more downward integration, with the steel producer getting into fabricating closer to the consumer.

Q. What about selling and administrative changes?

A. We see no major change in selling principles. Pricing policies may undergo minor changes, but the price system consisting of a base price plus extras will probably survive.

Q. How about new products?

A. The passing of twenty-five years will not result in new products as such. Rather, they will be recognizable as steel as we think of steel now, although the ingredients may be different and therefore the uses to which it will be put.

Q. Will there be any significant shift in location of steel producing centers?

A. The shift in steel will be very slow, but should continue along the lines now evident; namely, to the central U. S., to the west and southwest. Some decentralization is to be expected, but barring a major war, the centers of steel pro-

duction today will still be so classed twenty-five years from now.

Q. Where will automation fit into the picture?

A. Automation in the steel industry, as in all industries, will be given added impetus by the diminishing margin between costs and prices. We are in a spot where man-hours cost more than machinery.

Q. What about the "all-steel" home as a market?

A. Steel has not made great inroads into residential construction itself and there is not any great indication that it will in the future. The trend in architecture toward the use of steel and concrete forms, while eminently successful in the commercial field, has had little impact on home construction. Even the inclination toward contemporary design in housing has not caused steel to be used to any great extent.

Q. What is in the cards for titanium?

A. Titanium appears to have its future in engineering and technical products, or processing procedures, rather than those normally thought of in consumer fields, such as refrigerators, washing machines, etc. We make this assumption because of the relationship of its cost (even though declining steadily as evidenced by various price reductions) to the cost of other materials, giving consideration to the physical characteristics of each.



L. S. Hamaker
General Manager of Sales
Republic Steel Corp.

Q. How about the outlook for powder metallurgy?

A. In powder metallurgy we feel there are tremendous advances to be made. The products of powder metallurgy are likely to move into the consumer products field as fabrication and production techniques advance.

Q. Do you look for much improvement in so-called high strength steels?

A. While progress towards higher strength in the ferrous alloys will continue to be made, the rate of progress may not be as rapid as in the past. In this connection, we are considering the advances made with the "super-steels" as already in the picture. It should be noted that every advance in this area of strength brings new problems of fabrication and also that for many mass production applications, cost is more significant than increased strength.

Q. What about steel exports and imports?

A. The export and import demand for steel will no doubt continue to fluctuate with changing economic conditions. We have, however, sold our steels in world markets for many years. We are still doing so, and believe there will be a continuing demand from abroad for American steels.

STAINLESS: The Auto Market Is Tops

Stainless steel is holding its own in auto market despite tough competition . . . Shipments to industry have doubled since 1948 . . . 1955 will set all-time record . . . Per-car use estimated at 30 lb.

♦ **THE AUTOMOTIVE** industry is stainless steel's biggest customer. Despite tough competition from other metals and materials, the automotive market for stainless has doubled in size since 1948. Stainless producers have had a tough job keeping up with demand this year.

On the basis of shipments through the first half and the tempo of auto production at present and anticipated over balance of the year, it's estimated that stainless shipments to auto producers in '55 will set an all-time high of 135,000 tons. This compares with the previous record of approximately 128,000 tons in 1953.

Some 93 pct of automotive stainless consumption is strip, which finds its way into a variety of applications for both appearance and functional purposes.

While aluminum and other metals have made some inroads into the automotive applications enjoyed by stainless, the per-car use of stainless over the years has been remarkably stable. On the basis of shipments in 1954 of 83,303 tons and cars produced of 5.5 million, average gross consumption per car including trimmings, rejects, and so on, was around 30 lb. Five years ago it was approximately 23 lb.

Stainless Makes Friends

Since nearly 100 pct of the stainless used on automobiles is straight-chrome type, the ups and downs of nickel supply have no effect on this market despite an inadvertent assertion in an IRON AGE article (THE IRON AGE, Oct. 6, 1955, p. 155) implying a contrary view. Neither is stainless "too expensive to use" nor "also hard to

get," as the article erroneously stated. In fact, even chrome-nickel stainless consumers in automotive and other industries have not had orders turned down.

The average car owner fails to realize the amount of stainless used in his automobile. Says a leading producer:

"Although it is not commonly understood among auto buyers, much of the bright work on today's cars that is usually called 'chrome' is actually stainless steel. Generally, the parts that are made of stainless have been limited to those that can be economically fabricated from flat-rolled sheet or strip.

"While the ultimate consumer hasn't been too aware that he has some stainless on his car, this material has made a lot of friends. Auto engineers have liked it because it is strong and withstands the impact of parking lot bumps and the impact of stones and gravel on the road. This fact has

led to the very common application of stainless for body moldings that are used to prevent paint from chipping on doors and fenders."

Winter driving with its inclement weather and the use of highly corrosive agents to prevent ice formation on highways is another reason why stainless has found such widespread uses in the automotive field. This puts the corrosive resistance of stainless steel at a premium for those parts of automotive trim that are subjected to road dirt.

Strip Index Rises

Here's another indication of stainless use by the auto industry: Using 1948 as an index of 100, the index of net tons of stainless strip shipped to all industries for 1954 is 150. The parallel index for strip shipped to the auto industry during 1954 is 177. The use index for passenger cars for 1954 is 141.

It Hasn't Come Easy!

■ "The stainless producers have never gained any of these markets for automotive consumption easily. Each individual application has represented a tough competitive battle with other metals.

Although this competitive battle continues, the consumption of stainless steel per car has been gradually increasing and the producers feel confident that the combination of strength, corrosion resistance and appearance will assure a continuing major market in this field."

(Allegheny Ludlum Steel Corp.)

Stainless Steel Shipments To Automotive Industry, Net Tons

	Total Mill Shipments	Cold-Rolled Strip
1955 (6 mo.)	72,921	68,518
1955 (est.)*	135,000*	126,500*
1954	86,303	82,058
1953	127,993	117,944
1952	62,317	60,219
1951	85,346	80,895
1950	81,800	77,107

*IRON AGE estimate. Data: American Iron and Steel Institute.

LOCOMOTIVES: British Outbid

West Germany lands biggest segment of latest Indian contract . . . Austria, Czechoslovakia among cheapest bids with best delivery . . . Satellites pool for portion.

◆ FOR THE first time the old empire ties played second fiddle to economy and British firms did not land a single section of a contract to supply India with 431 steam and electric locomotives.

The lion's share of the order went to West Germany which not only bid 6 to 7 pct below the cheapest British offers but also accepted certain conditions involving such technical items as special water deposits for desert traffic and air conditioning. To insure the sale West Germany also offered considerably more favorable delivery terms. She will supply 176 locomotives.

Cheapest bids came from Japan. But only 125 units were ordered

from this source because of the unusually late delivery date.

Biggest surprise in the bidding were Austrian and Czechoslovakian firms which were in contention both in price and terms. To celebrate their return to the export market after having been freed from Russian control, the Austrians beat the British bid by as much as 16 pct and landed an order for 50 passenger and freight locomotives, most of them for mountainous track. Under Russia's thumb the Austrians had been forced to ship all of their export production behind the Iron Curtain. The Indian contract and the statement by one of the major locomotive producers, Floridsdor-

fer Lokomotwerke in Vienna, that they are ready to export 120 units annually, definitely marks Austria's return to competition.

The fact that Czechoslovakia was able to get an order for 40 heavy freight locomotives is a good indication that Russia is no longer in the market for this item. Further evidence of this was the success of Hungary and Poland. However, in order to maintain their position in the late stages of the bidding, the two satellites were forced to pool their offer and the biggest share of the profits from the 40 high speed steam and electric passenger locomotives they will deliver will undoubtedly go to Hungary.

FOREIGN BRIEFS

■ **RUSSIAN** machine tool works Ilytich of Leningrad, Proletaryi of Gomel, and Frunse of Slovgorod have secured orders through a West Berlin export company from May through August, for \$41.8 million worth of lathes, automatic shapers, and presses. Buyers were allowed to view the equipment in Russia.

■ **REPORT** on outboard motors indicates that 92 pct of all such units sold in Europe are American made. In the largest sizes there is virtually no competition for U.S. products. European prices are too high for inferior quality.

■ **ZINC** refinery near Carinthia, Austria, has been built by the Bleiburger Bergwerks Union at a cost of about \$3 million, of which \$2.8 million originated in this country. Capacity is 11,000 metric tons of electrolytic zinc per year.

■ **AUTO INDUSTRY** in England is in a difficult spot. A financial publication emphasizing that sale performances in North America and Europe is discouraging, declares that a proposed expansion program will flop unless markets improve.

TRADE PROBLEM

■ **Federal Trade Commission** ruling prohibiting export trade associations between U.S. and foreign companies has the European steelmakers worried. Although united within their own organization, they do not have, on the surface, any direct connection with American producers.

However, it is no secret that the European steelmakers regulate the price of their product both in the U.S. and within their own group directly with standard domestic price. Whenever American steelmakers increased prices, almost without exception the Europeans have followed suit within 24 hours. They even adhere to the American policy of setting different quotations for different parts of the country.

The Europeans are afraid they will be accused of attempting to eliminate competition on the domestic American market, a violation of FTC rules under the Webb-Pomerene Act.

■ There are strong indications that they will attempt to solve the problem by seeking to get one of their more important U.S. representatives prosecuted, bearing the cost within the organization, in order to set a judicial precedent.

Spending:

Defense Dept. outlays will hold at \$34 billion.

Defense Dept. spending rate is holding at about \$34.5 billion a year, approximately \$500 million more than was estimated by the Eisenhower Administration last January.

Unless there are major cuts in military programs—and Defense Sec. Wilson says none are contemplated—spending will remain at \$34 billion or more in coming months.

One area in which no top-rung Administration official has proposed cutbacks is that of the overseas bases, though there may be congressional pressure in 1956 for such action. Many of these bases are considered vital to the successful use of the B-47 bomber, which is of medium range and requires air-refueling to reach distant targets and return.

Cost Plenty

Eventually, the intercontinental B-52 will give added striking power to the Strategic Air Command. It is just coming into service on a hurry-up basis, and only the obsolescent B-36 is available in quantity for long-range attack.

The new planes are tremendously expensive, the B-47 priced at \$2 million per unit and the B-52 at \$8.7 million. Air Force investment is going up, as combat wings grow from the present 108 to 137 in 1957.

Army costs also are very heavy, even though numerical strength has dropped by about 400,000 in the past three years. New automatic weapons, improved communications equipment, and a new uniform that will come into general use after mid-1956 will mean big outlays for the 20 divisions and smaller units.

Name Defense Aid

Lee R. Shannon, former rubber company budget officer, is the new assistant to Defense Dept. Comptroller Wilfred J. McNeil.

Mr. Shannon, budget director of the Firestone Tire and Rubber Co., Akron, since 1946, is the first appointee to the new position. As a

Deputy Assistant Secretary of Defense, he will handle programming and planning in the comptroller's office.

The new official joined Firestone in 1935 as a member of the auditing staff, and later served as comptroller of the firm's Rubber and Latex Products Co., Fall River, Mass.

Tax-Am:

ODM okays \$28.7 million for steel, aircraft, others.

Office of Defense Mobilization has issued another 32 certificates of necessity for fast tax amortization of \$28.7 million worth of new or expanded defense facilities in the two weeks ending Sept. 21.

The approvals could be the last big group under the wartime tax amortization program. ODM late last month closed the door on further tax amortization for all but 32 of the original 226 expansion goals in the program.

ODM action permits U. S. Steel Corp. to write off in five years 65

pct of \$4,707,000 for special forgings for military end items at its Homestead, Pa., plant.

Uranium Reduction Co., Moab, Utah, can amortize 80 pct of \$10 million for uranium processing facilities.

Allegheny Ludlum Steel Corp., received certificates for three titanium processing facilities, one at Brackenridge, Pa., 75 pct of \$1,590,000; another at Watervliet, N. Y., 65 pct of \$307,000, and a third at Dunkirk, N. Y., 65 pct of \$397,000. The firm also receives a certificate for 65 pct of \$189,000 for research and development facilities at Brackenridge.

The Dow Chemical Co., Midland, Mich., received a research and development certificate covering 40 pct of \$1,044,800.

United Aircraft Corp., Pratt & Whitney Aircraft Div., East Hartford, Conn., received 65 pct of \$1,712,000 for military aircraft engines for the Air Force.

Building a Lock Is a Big Job

◆ ADVANCE notice to bid on construction of the Robinson Bay Lock in the St. Lawrence Seaway has been issued by the Corps of Engineers, U. S. Army. Specifications will be issued in November.

The lock is the first sizable contract on the U. S. portion of the Seaway which is not primarily for excavation and dike construction. It is located about 3½ miles northeast of Massena, New York, the upper lock in the Long Sault Canal in the International Rapids.

This lock, first to be constructed on the U. S. side, will be 860 ft long, 80 ft wide, with a lift of 49 ft. Walls will vary from 105 to 115 ft in height.

In order to construct the lock, the contractor will be required to remove 3.2 million cu yd of earth, 9000 cu yd of rock, placing 525 cu yd of mass concrete and 10,000 cu yd in thin wall sections.

The contractor will use about

2,260,000 lb of reinforced steel, and construct two lock control stations on the upper and lower gate monoliths. Bidder will be expected to construct a highway tunnel about 29 ft wide under the lock and about 25 ft in diameter through earth sections leading to the lock, and having a total length of 477 ft with an interior finish of ceramic tile.

Other features include: Timber protection for approach walls and steel armor protection for the lock.

Upper and lower miter gates and machinery, tainter valves and valve machinery.

Vertical lift gate and machinery, for emergency use.

Sewage disposal system and storm drainage system.

Miscellaneous work such as culvert bulkheads, dike embankments, stone protection, painting and other incidentals.

EXPANSION IN INDUSTRY

\$90 Million:

Kaiser completes financing in five-plant expansion program.

With financing arrangements completed, Kaiser Aluminum & Chemical Corp.'s \$90 million expansion program involving five of the company's principal manufacturing plants is now underway.

Major project is at the company's Ravenswood, W. Va., plant, where an additional \$75 million is being spent to enlarge and complete the initial facilities now under construction as a fully integrated sheet and foil rolling mill by early 1957.

Representing a total investment of about \$100 million, the Ravenswood works will have an annual capacity of 320 million lb of sheet and 13.5 million lb of foil.

Other plants involved include Halethorpe, Md., installation of one 3250-ton and three 2750-ton extrusion presses; Mead and Tacoma, Wash., reduction plants where primary aluminum capacity is being upped by 12.6 million lb and Chalmette, La., reduction

plant, where a cryolite recovery plant and facilities for direct chill casting of billet are being installed.

100 Pct Increase

New building and machinery to be obtained by the Union Metal Mfg. Co. at a cost of about \$1 million is aimed at boosting steel tube manufacturing capacity 100 pct.

Union Metal's primary product is street lighting poles.

The new building will add 51,400 sq ft of floor space for the additional machinery. New power facilities as well as a new boiler plant are also in the works. The program will be completed by the middle of 1956.

More Freight Cars

Pullman-Standard Car Mfg. Co. announced that as the first phase of a long range expansion and improvement program they would spend \$1 million on their Bessemer, Ala., plant in order to increase its annual freight car production from 1500 to 2000. This

is especially significant considering the fact that the Bessemer plant is the nation's leading producer of freight cars.

The new facilities will add 100,000 sq ft of building to the current operation.

Selection of the Bessemer plant for the initial expansion expenditure was prompted by the rapid growth of the industrial South, according to Pullman-Standard president Charles W. Bryan, Jr.

Even More:

Armco adds \$51 million to \$60 million expansion move

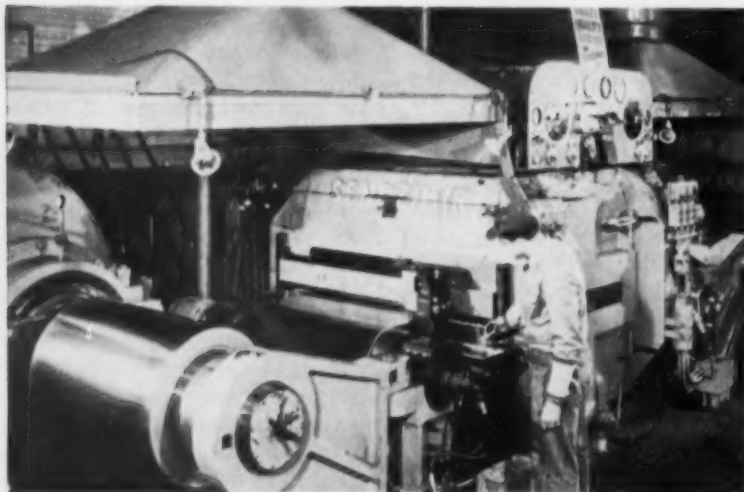
The Armco Steel Corp. has announced that an additional \$51 million would be expended in an expansion move to increase capacity by 1.176 million tons. Earlier in the year plans for spending \$60 million were made, making the grand expansion funds total about \$111 million.

Completion of the project is set for early in 1957. It is expected that the total ingot capacity will then be 6.126 million tons per annum or 25 pct higher than it is now.

Major part of the program will be centered around improving the facilities at Middletown, Ohio, with the remainder being spent on Sheffield Div. plants at Houston, Tex., Tulsa, Okla., and Kansas City.

Record Can Output

Production of all types of cans during the first half of 1955 ran 6 pct ahead of the same period last year and the outlook is that the can industry will finish the year with an alltime annual production record of 38 billion containers. This will be about 5 pct greater than the 36.2 billion made in 1954.

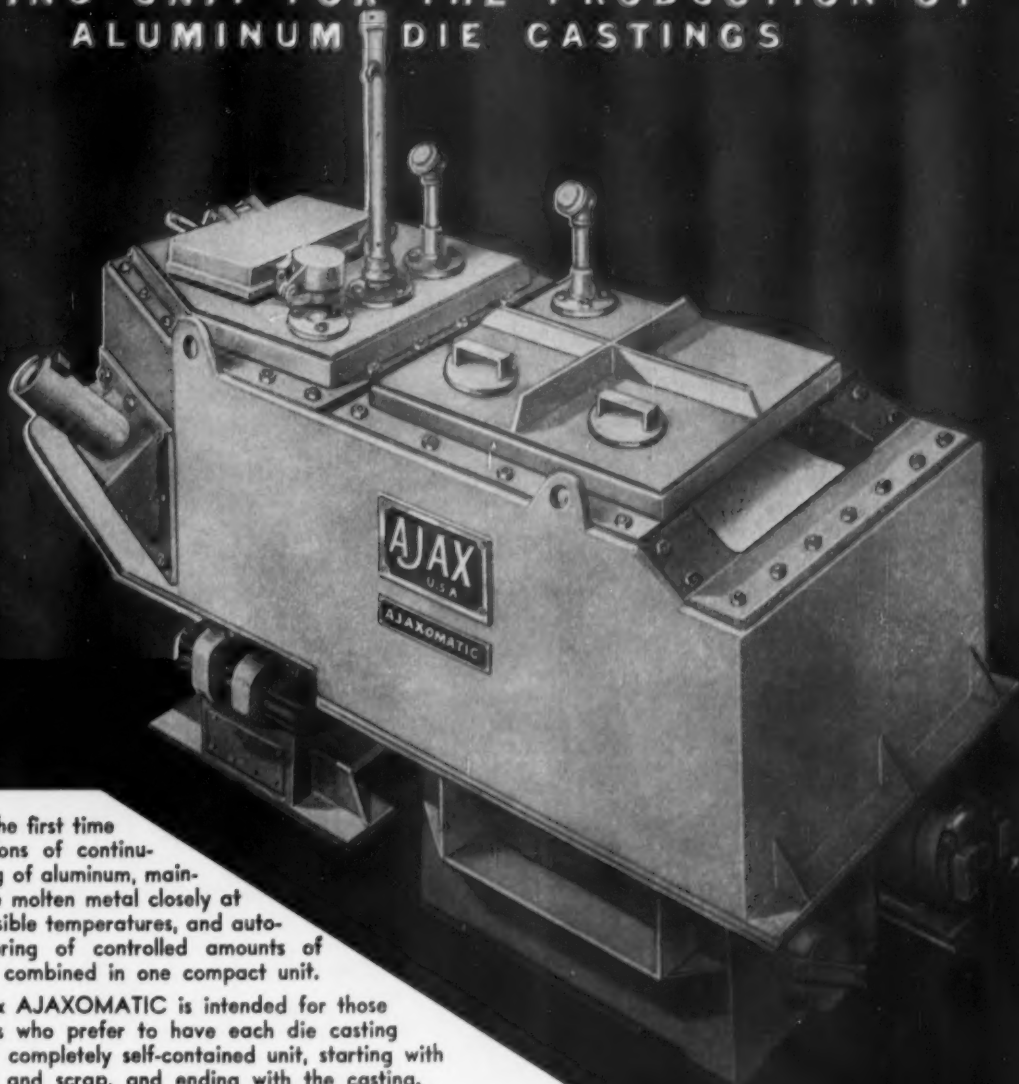


REPUBLIC Steel Corp.'s multi-million dollar expansion program includes this 48-in. Sendzimir mill for rolling stainless at Massillon.

The New DUPLEX AJAXOMATIC



AN INTEGRATED MELTING AND AUTOMATIC
POURING UNIT FOR THE PRODUCTION OF
ALUMINUM DIE CASTINGS



Here for the first time
the functions of continu-
ous melting of aluminum, main-
taining the molten metal closely at
lowest possible temperatures, and auto-
matic pouring of controlled amounts of
metal are combined in one compact unit.

The Duplex AJAXOMATIC is intended for those
die casters who prefer to have each die casting
machine a completely self-contained unit, starting with
pig metal and scrap, and ending with the casting.

This unit represents the ultimate in integration and automation to
match today's trend towards larger die castings and higher produc-
tion rates per machine and per manhour.

See It On Display at the Metal Show, BOOTH 1619

AJAX

TAMA-WYATT



AJAX ENGINEERING CORP., TRENTON 7, N. J.

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., The Ajax Mulligan Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting



WE DON'T STOP WITH THE DELIVERY OF A CHEMICAL — we put it to work and keep it working effectively

The chemical treatment of metals and metal parts—to prepare them for further processing, to protect them, to beautify them—has grown from a haphazard operation to a highly technical one. Supplying the chemical ingredients is a relatively simple job. Putting them to work and keeping them working effectively in your plant demands the skill of an experienced organization. We have that organization.

We supply not only the metal-treating chemicals, but also—free of charge—the technical and engineering service to keep them working at top efficiency. We

furnish assistance in developing and installing the process, we maintain continuing inspection of the process and equipment if you so desire, we check samples of the processed metals in our Quality Control Laboratories—all these are part of the ACP service at your command.

That's why we say, "We don't stop with the delivery of a chemical—we put it to work and keep it working effectively." And we have been doing this for over 40 years. Write for a booklet describing ACP products and services.

AMERICAN CHEMICAL PAINT COMPANY, Ambler 20, Pa.

DETROIT, MICHIGAN

IRVINE, CALIFORNIA

WINDSOR, ONTARIO





MORGAN
WORCESTER

Three Strand Continuous Rod Mill

COLORADO FUEL AND IRON CORP.

Pueblo, Colorado

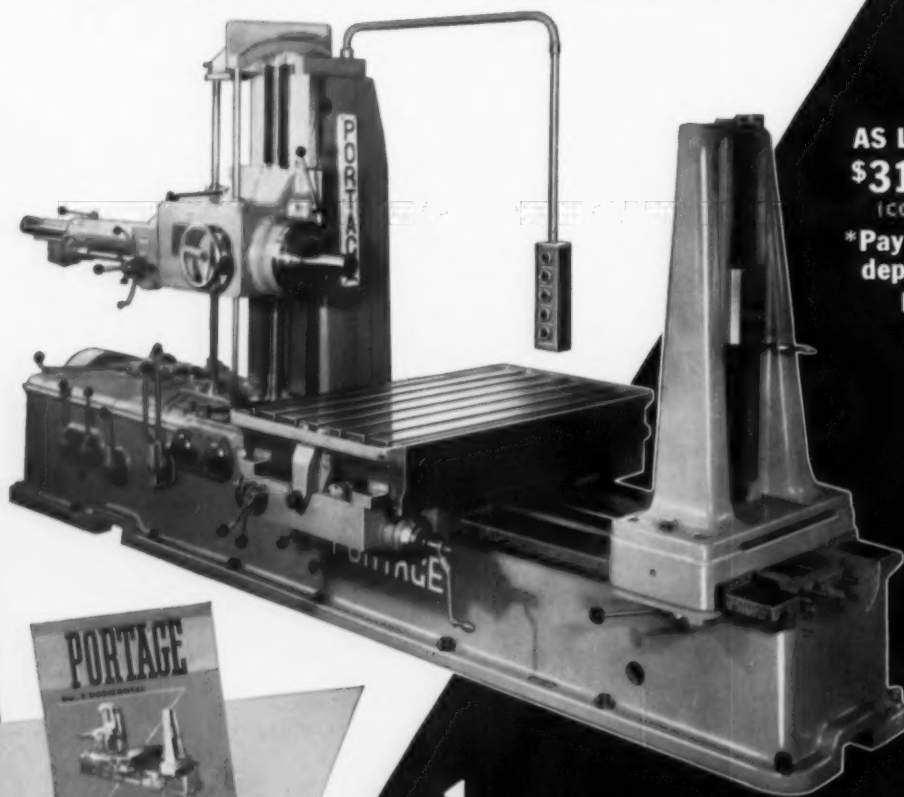
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ROLLING MILLS • MORGAN BEARINGS • WIRE MILLS • REGENERATIVE FURNACE CONTROL • EJECTORS • GAS PRODUCERS
H. H. Wood, Rep., Koppers Bldg., Pittsburgh, Pa. English Rep., International Construction Co., 56 Kingsway, London W. C. 2, Eng.

PORTAGE

(4" Diameter Spindle)

Horizontal Boring, Drilling & Milling Machine Outstanding ...

MACHINE OF THE YEAR
Unsurpassed in Price and Quality



AS LOW AS
\$31,358
(COMPLETE)

***Pay as you
depreciate
plan**



**Write for Catalog
today!**

PORTAGE

The PORTAGE Boring, Drilling & Milling Machine offers a real saving in new machine investment. PORTAGE mills cost from 5% to 20% LESS than present comparable makes . . . and the amazing part of this savings is the machine itself . . . Write today for literature covering all the specifications and features on the PORTAGE Mill.

*** For full particulars, phone the factory today!**

THE PORTAGE MACHINE CO.

1035 Switzer Avenue • Akron 11, Ohio
Representatives in Principal Cities

BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916

Report to Management

It's a Sure Thing

You don't have to go to the track to get in on one of the best parleys in years. It's going on right now and metalworking firms are in the best position to take advantage of it in the months ahead.

Heavy demands from consumers which resulted in record breaking production earlier in 1955 are now backed up by new and heavy expenditures for plants and equipment. This new wave of spending for capital improvements is necessary because of sustained peak production, strained to the maximum facilities, and continued capacity output.

Manufacturers will be the big spenders for capital improvements in the last quarter of the year. You can expect them to spend at a rate better than \$12 billion annually in the final quarter. It will beat the previous quarterly record set in the first three months of 1953.

This represents a 20 pct increase from the first to final quarters this year. It also means that manufacturers have revised upwards their original estimates of what they intended to spend this year.

Record expenditures are scheduled by transportation equipment, machinery, and stone, clay and glass groups, according to the Dept. of Commerce. Automotive expenditures will be somewhat less than last year, because of the comparatively smaller amount of tooling for 1956 models. But aircraft and railroad equipment makers have scheduled new highs for spending.

Construction and Credit

Government experts are still concerned about credit restrictions in regard to home building. They were first alarmed when housing starts dropped off in July, but reassured in August when things picked up.

Now they are worried again and believe that the credit curbs have taken effect with a subsequent drop in home building.

They may be wrong again

because the so-called housing boom is deeply rooted and not readily subject to statistical studies. It is based on a universal desire for better homes, new homes for new families, larger homes for growing families and an apparent strong desire to move from the apartment to the suburb.

But restrictions may be lifted despite what happens to housing starts. Pure politics will be the cause if nothing else. Home buyers want low down payments, longer mortgages. The GOP may have to relax restrictions with elections coming up.

Paychecks Are Bigger

You have heard a lot about disposable income. As an employer, you have contributed to it in the past year with higher payrolls. Over the past year, average weekly wages for factory workers have increased \$6.05.

Biggest increases were registered among the durable goods producers, who not only gave substantial pay increases but are working longer hours now than a year ago. Average gain for durable goods industries is \$7.24 per week.

Inflation and Inventories

You can expect some businessmen to take a look at the economic barometer and get the idea that inflationary prices are on the way. It's only one more step before they start building up inventories against possible higher prices a year or six months from now.

There isn't much room for that kind of buying. Materials that are apt to move up in price are those in short supply now. It's doubtful if you will see much inflation hedging for only that reason. But it will still be a secondary support factor.

INDUSTRIAL BRIEFS

New Company . . . The assets and business of the Niles-Bement-Pond Co., recently merged into the Penn-Texas Corp., has been transferred to the newly formed Pratt & Whitney Co., Inc., as a completely owned subsidiary. L. D. Silberstein, president and chairman of Penn-Texas declared that the name had been chosen because the Pratt & Whitney div. was the primary operating unit of Niles and the fact that the name is well known in the machine and cutting tool field. Chandler-Evans will operate as a div. of Pratt & Whitney, while Potter & Johnson Co. of Pawtucket, R. I., will become a direct subsidiary.

Buy's Lab . . . George L. Nankervis Co., Detroit, manufacturer of laboratory and production testing equipment for automotive and aircraft, has purchased the entire assets of Commercial Research Laboratories, Inc., Detroit, builders of flowmeters and related equipment. Commercial will continue to operate as before as a division of Nankervis.

New Name . . . A resolution to change the name of the Piasecki Helicopter Corp. to Vertiplane Corp. will be placed before a special meeting of shareholders late in Oct. The reason listed for the proposed change is to better describe the activities of the company and to remove the confusion resulting from two firms with similar names.

Relocate . . . Federal Motor Truck Co., a division of Napco Industries, Inc., is moving from Detroit to Minneapolis to become the only mfg. of automotive vehicles in the state of Minnesota.

Acquisition . . . U. S. Industries, Inc., has acquired all the assets of Garrett Oil Tools, Inc., Longview, Texas, in return for 121,370 shares of its common stock.

Walworth Expansion . . . The assets and business of Alloy Steel Products Co., Inc., manufacturers of stainless steel valves, has been acquired by the Walworth Co. in exchange for cash and common stock. The facilities will be used to develop valves and pipe fittings for nuclear reactors and power plants.

Radar Contract . . . The U. S. Air Force has ordered \$2.34 million worth of magnetrons from Westinghouse Electronic Tube Div. The magnetron is a power-generating tube used in radar systems.

School Days . . . Standard Pressed Steel Co., Jenkintown, Pa., is sponsoring courses in application of creative thinking to management problems, leadership and communications being given at the plant as an extension service of Penn State University. One hundred thirty-five employees are studying on company time.

50 Years . . . American Cast Iron Pipe Co., recently celebrated the 50th anniversary of the founding of the firm. One of its claims to fame is that it was the first pipe foundry in America to cast iron pipe in 16 ft lengths.

New Plant . . . Stauffer Chemical Co. announced plans for a new multi-million dollar petrochemical plant adjacent to their present Louisville, Ky., operation. Construction is set for early in 1956 for completion in 1957.

Builds Hangar . . . AiResearch Aviation Service Div. of Garrett Corp., specializing in modification and overhaul of business aircraft, has signed a long-term lease for 25 acres of Los Angeles International Airport property for the construction of a new \$600,000 hangar and administration building.

Steel Pipe . . . Fluor Corp., Ltd., of Canada, has formed the Prairie Pipe Co., Ltd., to operate as an affiliate, to mfg. steel pipe for the oil and gas industries. Fluor will construct the plant on a Regina, Saskatchewan site at a total cost of \$3.5 million. Steel supply will come from mills in Canada and Eastern U. S.

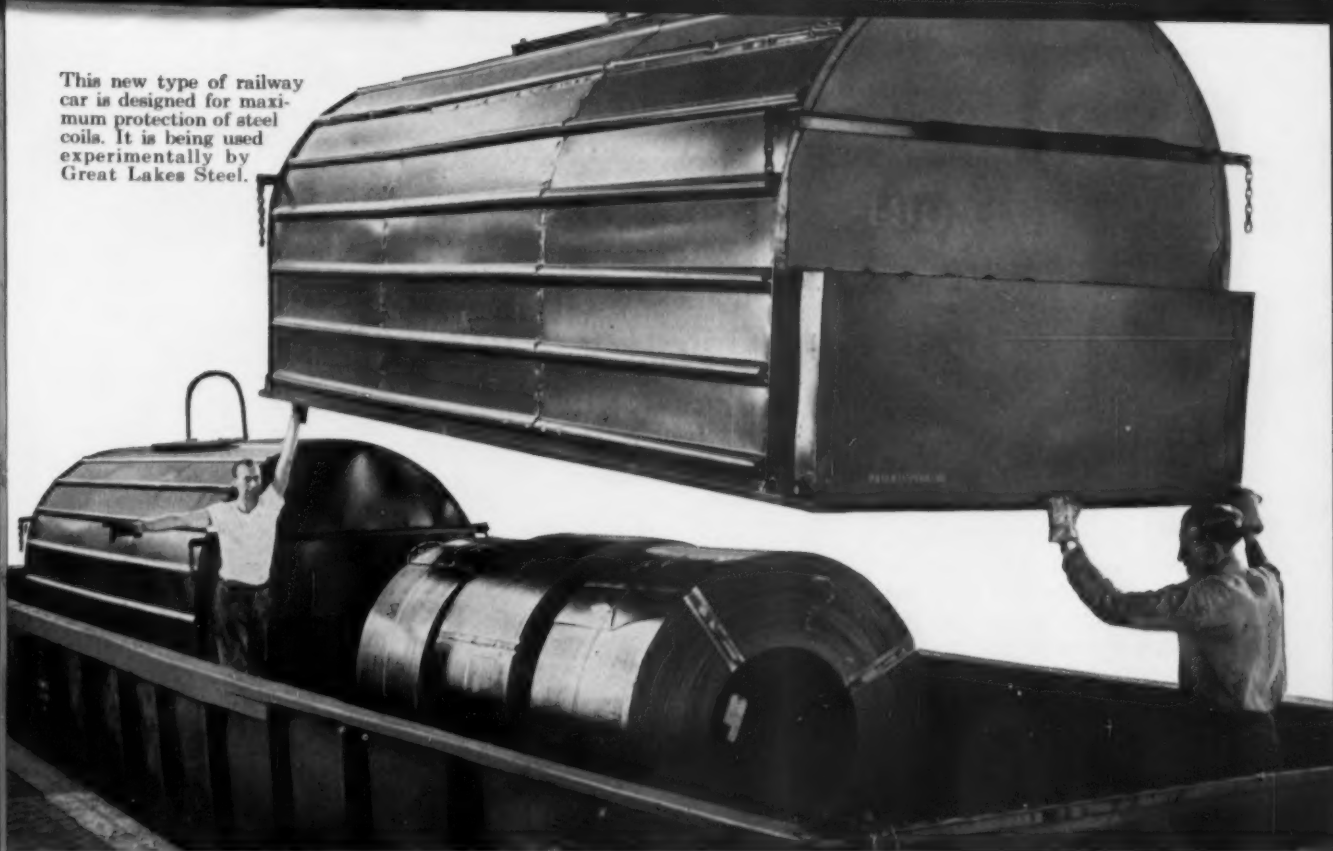
Total Holdings . . . Merritt-Chapman & Scott Corp., reports that it now holds more than 96 pct of the outstanding shares of six subsidiaries following expiration of an exchange offer to holders of the subsidiaries' stock. Initial holdings in the six firms were obtained in 1954 and earlier this year. The companies referred to are Devoe & Reynolds Co., Inc.; Tennessee Products & Chemicals Corp.; New York Shipbuilding Corp.; Newport Steel Corp.; Marion Power Shovel Co.; The Osgood Co.

Research . . . for Profit will be the theme of an industrial research conference planned by Armour Research Foundation of Illinois Institute of Technology in April 1956 on the Illinois Tech campus.

Light No. 7 . . . Number seven blast furnace at the Homestead District Works of U. S. Steel was recently relighted after three months of downtime for complete relining. Since its erection in 1907 this unit has produced over 10 million tons of steel.

Better Insulator . . . General Electric's instrument department at Lynn, Mass., has announced the perfection of a reinforced butyl to fortify organic compounds used as electrical insulators, against high voltage discharges. Known professionally as HY-BUTE/60, the material is formulated to eliminate maintenance and susceptibility to mechanical damage.

This new type of railway car is designed for maximum protection of steel coils. It is being used experimentally by Great Lakes Steel.



How Great Lakes Steel *delivers* quality



Another order receives individual attention as sheets of steel are wrapped with a waterproof covering and banded to meet the customer's specifications.

Steel coils (below) are securely blocked on a truck and trailer at Great Lakes Steel. Heavy tarpaulin cover is provided by truckers as standard equipment for additional protection.



The emphasis on quality at every stage of production at Great Lakes Steel extends right on through to the Delivery Department. There, careful attention is given to handling and packaging each coil and bundle to make sure that the customer receives his order in prime condition.

The Delivery Department has another important responsibility, too. It must see that our products reach each customer in ample time to meet his production schedules.

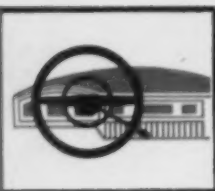
For quality with service—that extends all the way from the beginning of our operations to the end of yours—call on Great Lakes for your flat-rolled steel requirements.

GREAT LAKES STEEL CORPORATION

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District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.



Last Quarter Looks Good to Automakers

Output passes 6 million in record time . . . No letup seen for last months of 1955 . . . GM eyes record year in units and dollars . . . Chrysler launches expansion program, shows new lines—By T. L. Carry.

♦ THE 6 MILLIONTH car to be produced in 1955 rolled off the assembly lines here last week and with new model production getting started this month, the industry isn't going to have any trouble turning out at least another 1½ million by the end of December.

This is the earliest in the history of the industry that production hit 6 million. The figure was not reached in the previous peak year of 1950 until November.

The production also surpasses the total of 5,509,000 autos which were produced during 1954.

Meantime, sales at the factory level continue to set records. Figures recently made available from the Automobile Manufacturers Assn. show that for the first 8 months of this year factories sold

a record 5,506,075 cars. For the same period in 1954, 3,868,520 cars were sold. The 8-month record this year almost surpasses the 5,558,897 cars sold for the whole year of 1954.

Skeptics Wrong . . . The figures show that people who have been skeptical about the amount of cars to be made and sold this year are going to have to take another look. And they might start by listening to Harlow H. Curtice, president of General Motors Corp., who has in the past demonstrated an uncanny ability to forecast the economic prospects for the country.

Mr. Curtice is confident that the current wave of prosperity will continue through the remainder of 1955. He says that the

last 3 months this year will be as prosperous for business generally as the first 9 months were.

As for General Motors, Mr. Curtice says 1955 will be a record year for the corporation both for unit and dollar sales.

Mr. Curtice is not ready for a definite prediction about 1956 but says he is certain that demand for cars will continue at a very high level.

Chrysler Expands . . . The 5-year expansion plan announced by Chrysler Corp. last month has already started to take place.

A huge new stamping and fabricating facility is going to be built by Chrysler in Macedonia, O., for the production of parts for Chrysler's assembly plants in Michigan, Indiana and California.

There are several reasons behind the decision to build the plant in Ohio. Previously, all of Chrysler's stamping has been done in the Detroit area by the corporation's Automotive Body Div. The new plant will take some of the pressure off Detroit and at the same time, because of its location, will put Chrysler closer to some of the nation's major steel producers.

The plant is also part of an overall plan to move some manufacturing facilities to the east coast. Among other things, Chrysler is considering construction of an assembly plant in the southern New Jersey area.

Labor a Factor . . . Also, it should not be overlooked that when Chrysler bought the Briggs facilities in 1954, it inherited a



DARK or daylight, it makes no difference in the swift operation of the new T-3 safety aimer for adjusting headlight beams. Details on Page 79.

RB&W FASTENERS -

Strong Point of any assembly



Where the heat's on to lift bolts and nuts out of the ordinary

You won't see these spheroidizing furnaces in many bolt and nut plants. They call for a big investment of money. But to a company that wants to be sure of conditioning metal for the best bolt and nut possible, they're worth it.

In the photo above, you see R. M. Hubley setting up to anneal coils of wire rod to change its structure for the better. Next, he'll hoist the furnace at right, setting it down over the stacked coils. This special equipment makes it possible to accurately control the heating, cooling and the atmospheric conditions inside the housing.

Working with the most modern and complete facilities, RB&W men can bring to bear the full extent of their experience. And experienced they are . . . most have long years of service in the company. Some have followed their fathers' and even grandfathers' footsteps.

It's this combination of equipment, experience and quality control throughout RB&W plants that assures you more quality for your money . . . a reliable source of supply . . . and strong fasteners that never let you down.

Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.



Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** New Orleans; Denver; Seattle. **Distributors** from coast to coast.

Case No. 107

Harris Steel Co. Reports:

- 4 Years' Trouble-Free Service
- Constant 24-Hour Operation
- Careful Control of Quality

Bright Annealing Furnaces Use Kemp Atmos Gas Generators to Supply Controlled Atmosphere of Uniform High Quality

Bright annealed steel is produced by Harris Steel Company, Kearny, New Jersey, with the help of two Kemp Model 6-MR Atmos Gas Producers. These two Kemp Generators burn city gas, to supply twelve furnace bases with purified controlled atmosphere.

Treating gas 24 hours a day, seven days a week, each Kemp unit produces 6,000 cfh of gas . . . enough to meet the needs of annealing 4,000 to 5,000 tons of steel per month.

User Reports Complete Satisfaction

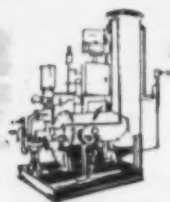
Mr. Harry Vane, Plant Superintendent, reports "These Kemp units have been in constant service for 4 years without a bit of trouble. The only maintenance needed has been ordinary routine. Because of the constant purity and qualitative analysis of the gas the Kemp Generators produce, we have been able to secure constant control of color, temper and quality of our output."

Kemp Can Help You, Too

If efficient, carefully-controlled supply of protective atmosphere gas can help you solve production problems, it will pay you to call in a Kemp Engineer for a detailed discussion of your needs. No obligation, of course.

Write for C. M. KEMP MFG. CO.,
405 E. Oliver Street, Baltimore 2, Maryland.

KEMP OF BALTIMORE



ATMOS GAS GENERATORS

ADSORPTIVE DRYERS • SINGEING EQUIPMENT
IMMERSION MELTING POTS
CARBURETORS • BURNERS • FIRE CHECKS



Michael J. Giordano inspects test burner on one of twin Kemp Atmos Gas Producers.



General view of Harris Steel Co. Bright Annealing Department, showing several of the 12 annealing furnaces supplied with Atmos Gas by Kemp Model 6-MR Generators.

This Kemp industrial carburetor—the heart of every Kemp installation—assures the desired analysis of protective atmosphere gas under any demand without waste . . . without frequent adjustments.



Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Oct. 8, 1955	84,388	17,910
Oct. 1, 1955	120,665	23,869
Oct. 9, 1954	65,564	16,046
Oct. 2, 1954	66,244	17,866

*Estimated Source: Ward's Reports

great many labor problems along with the creation of the Automotive Body Div.

It's possible that Chrysler, which has not decentralized or dispersed as much as GM or Ford, is motivated in part by the continuing labor headaches in that division.

Cost of construction on the 300-acre site will be \$85 million. The plant itself will cover 34 acres.

Lights:

GM unit makes aiming easy.

One thing that can be said about General Motors is that if the corporation doesn't do something first, it tries to go the industry one better.

A good example of this is the safety beam headlight developed last year on an industrywide basis. The new lights are now standard equipment on all makes of cars. They are specially designed to throw a longer lower beam and also have a black filament cap which reduces glare when driving in rain and snow.

Easy Installation

But today the Guide Lamp Div. is introducing a headlight which incorporates the features developed by the industry but also has what the division calls a built in "safety aim."

Guide Lamp has also developed a special aiming device for use in installing the lights. The aimer makes it possible for an individual to install and aim correctly a set of lights in a matter of minutes. The job can be done in broad daylight and in a space no larger than the car itself.

Key feature of the new lamp is in three glass knobs which are cast

into the lens to form a triangle. A plane laid across these three points forms a surface at right angles to the axis of the light beam. The plane formed by these points positions the headlight accurately when it is installed with the aimer.

Here is how the aimer works. The device contains a level which can be adjusted by turning the screws holding the light on the car. When the bubble in the level is centered, the correct vertical aim is established.

To obtain the correct horizontal aim, a string is lined up across the aimers on the headlights being installed. The aimer is rotated around the lamp ring so that the cross arms are level with the string. The headlamp is adjusted by turning screws in or out so that the cross arm barely touches the string.

C. A. Michel, general manager of Guide Lamp Div., says the aiming device has tremendous meaning for all motorists. Mr. Michel points out that over half the cars on the road today have headlights that are incorrectly aimed. The result is unsafe driving and Mr. Michel says the new lamp will be a great contribution to night driving.

AUTOMOTIVE NEWS

New Chrysler Line

It should be obvious by now that 1956 is a facelift year for most of the automobile producers who are saving the big changes for 1957. Chrysler Corp. has gone along with the industry on the facelift theory but it has come up with some new designs that make the cars look quite a bit different from the 1955 models even though no basic body changes have been made.

Most outstanding feature is the rear fenders on both the Chrysler and the Imperial which have been raised to give the cars a swooping look. The Imperial engine has 354 cu in. displacement with a 9 to 1 compression ratio and delivers 280 hp. The 1956 model is also 5½ in. longer with a wheelbase of 133 in.

The Chrysler New Yorker and Windsor models feature engines that deliver from 225 to 280 hp.

New grilles and bumper treatment on the cars also add to their appearance. The rear bumpers conceal the tail pipe outlets.

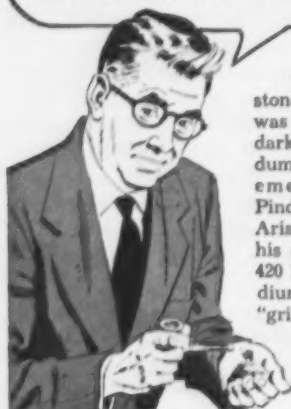
THE BULL OF THE WOODS

By J. R. Williams



EMERY WAS USED IN ANCIENT TIMES to abrade and polish metals and other substances.

NO. 4 OF A SERIES
ON THE HISTORY OF ABRASIVES
BY CHICAGO WHEEL & MFG. CO.



One of the important milestones in the history of abrasives was the discovery of emery, a dark granular variety of corundum. One of the first to mention emery was the Greek poet, Pindar, who wrote in 500 B.C. Aristophanes also mentions it in his comedy "The Peace," about 420 B.C., referring to it as a medium for "rubbing down" and "grinding down." It was of great value to ancient craftsmen in abrading iron and steel, gems and stone.



THE GREEK ISLE of Naxos furnished emery to the ancient world. Called the "stone of Naxos" it was highly prized, and brought high prices in the market places of Greece and the Near East.



THE ENTERPRISING GREEKS took the rough chunks of emery stone and ground them to powder. This was sieved for many applications including the polishing of gems. Even then the size of the grain apparently was important for the type of grinding or abrading to be done. Often the rough chunks or pebbles were used.



EMERY, in finely ground form, was sometimes bonded in pottery mixtures and baked to form "whetstones" or grinding stones. We can surmise that these stones were made in various sizes and shapes to suit the work to be done.

THE FINER FINISHES exhibited on tools, implements and weapons after the 4th century B.C. suggest the adoption of better abrasive materials of which emery undoubtedly was the most important. The polishing of metal, gems, statuary and wood carvings was accomplished with emery of various grains.



Emery today is one of the many abrasive substances employed by Chicago Wheel in the manufacture of grinding wheels and mounted points. Over 200 different shapes, sizes and grains of abrasive wheels are made by Chicago Wheel for every metal finishing operation.

**CHICAGO WHEEL
& MFG. CO.**

1101 W. Monroe
Chicago 7
Dept. 1A

Manufacturers of abrasives, precision grinding wheels and mounted points for over 65 years.



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THIS WEEK
IN
WASHINGTON

Where Will Tax Reductions Go?

Booming U. S. revenues, coming elections make slice sure . . . Both parties seek sponsoring role . . . Lower income brackets will get biggest chop . . . Most corporation rates will stand—By G. H. Baker.

♦ **TAX REDUCTION** is shaping up as a strong possibility for next year, despite the urgings of some government spenders for more, not less, revenue.

Next year the voters will pick the next President of the United States as well as the congressmen to represent their views, and the race is on between the Republicans and the Democrats to see which side can grab the credit for tax relief.

Both sides are loud in their promises to ease the tax burden on "the little fellow."

Who Gets Cuts . . . Because tax collections are coming into the Treasury at a surprisingly healthy rate, there is no longer any haggling over "fiscal irresponsibility" in reducing taxes. Only question now is who gets the tax cuts, and how much of a cut.

Persons earning up to \$6000 annually will get the biggest cuts. Those in the higher brackets will get smaller cuts. Corporations, under present plans, probably will get no relief at all from the existing rate of 52 pct. And the excise tax structure very likely will be left as is—with the possible exception of excises on automotive products. These may be eased somewhat.

Oppose Balance . . . A balanced federal budget has foes as well as friends strangely enough. Some congressional Democrats are now predicting gloomily that a balanced budget will "only bring on a depression." Takes too much

money out of circulation, they claim.

Nonsense, say the business experts. The budget is, for all practical purposes, in balance now. The gap between income and outgo is less than \$1.7 billion, and it is narrowing rapidly due to the better-than-hoped-for tax collections.

Tax collections from corporations, from individuals, and from excises all are over expectations this year. This is a healthy sign and shows that the business boom is general and is not confined to "big business" alone as is charged by Democrats.

Don't Lose Heart . . . As a businessman, you should avoid the temptation to put off your expansion plans because of any gloom-and-doom talk about President Eisenhower's health.

Keep this in mind: Nothing is changed about Ike's policies. The

same carefully-picked Eisenhower team that has brought the nation through three years of peace and prosperity is operating.

Refuse to take part in wild talk about a business recession resulting from Ike's illness. You can be sure that the Eisenhower "team" is steering the policies of government as efficiently and skillfully as ever, and that at least another 12 months of good business, good labor relations, and good government is on the books.

Ike's system of delegated responsibility is now paying dividends. Although he is personally taking a less active role as chief executive, the business of running the national government is going forward smoothly and without a hitch.

Eye Automation . . . A congressional committee is taking a wide-eyed look at the "problem" of

Money Supply Loosens

♦ **COUNTERFEITING** of paper money and coins and of altered money orders is on the rise. In 1954, \$140,000 worth of phony money was passed on merchants and others.

In its annual report—a reminder to dealers to scan money carefully and know persons for whom checks and money orders are cashed—the Secret Service says there were 63 new counterfeit note issues and variations turned out last year, and

more can be expected this year.

Total value of all counterfeit money made last year was \$348,000, of which \$208,000 worth was seized before it was circulated.

There were 31,931 government checks forged in 1954, of which 28,000—valued at \$2.3 million—were traced successfully. Some 2600 persons were arrested for forging government checks, including postal money orders.

NEW!

Four Of A Kind For Better Barrel-Finishing. The new Norton Tumblex "T" abrasive brings you an unbeatable combination for top performance: non-wedging triangular shape; fast-cutting bonded ALUNDUM® abrasive; and four sizes for the widest range of applications.

Brand new! . . . Norton TUMBLEX "T" **— bonded, triangular shape tumbling abrasive**

*Users report Tumblex "T" abrasive brings many new
"TOUCH of GOLD" benefits to barrel-finishing*

Here's one of the most revolutionary barrel-finishing innovations ever developed. In typical on-the-job tests, Norton customers report that the new Tumblex "T" tumbling abrasive:

- *"cuts tumbling cycle time from five hours to one hour."*
- *"finishes steel and magnesium parts that could never before be barrel-finished."*
- *"completely removes burrs from stainless steel parts in four hours. Abrasives previously used failed to do so in 12 hours."*

Everything about Tumblex "T" abrasive is designed for better barrel-finishing.

Its uniform triangular shape and size prevents wedging in recesses of parts.

Made of famous Norton ALUNDUM abrasive, it cuts fast, with no compound needed — resulting in shorter time

cycles and lower costs per piece finished.

It provides maximum surface contact with parts being processed, assuring top quality work in fastest time.

It wears down evenly, keeping the same triangular shape. No small chips to lodge in holes, slots, etc. — and when worn down it can be used on parts requiring a smaller size abrasive.

Its lightness means less weight required to fill the barrel. Results are more uniform finish, without roll-in or roll-over of edges of parts.

Its chemical inertness, unaffected by acids, compounds or detergents, prevents spoilage common to other types of abrasive.

Send Your Work Samples

to our newly enlarged Sample Processing Department. Let us prove to you how the latest barrel-finishing equipment and techniques can improve your product

quality and cut your finishing time and costs. NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone directory, yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass. G-294

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Sharpening Stones • Pressure Sensitive Tapes

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

automation, following a considerable period of nagging by labor bosses to do something about the new "threat" to jobs.

Sen. Douglas, D., Ill., ordered a joint Senate-House investigation of "the problem of automation" after union chiefs complained that installation of new automatic and electronic machines was furthering unemployment and threatening existing jobs.

Taxes:

Revenuers push tardy firms for half billion owed.

Internal Revenue Service is cracking down on employers who are using money from the withholding taxes they collect for business purposes instead of turning it over to the government promptly.

Top IRS officials reversed a lenient policy of the past when they received an estimate that delinquencies in withholding tax payments by employers are running close to a half-billion dollars. In some cases, firms have been forced into bankruptcy.

"It's not our policy to put anyone out of business, but if they thumb their noses at us, that's a different story," one official concedes. Some businessmen tried thumbing their noses with disastrous results.

Dipped Into Till

Unofficial estimates are that the amount of delinquent withholding tax payments climbed considerably during last year's recession.

Businessmen, who collect the taxes and forward it to the Treasury Dept. 30 days after the end of each fiscal quarter, apparently found themselves strapped for cash and dipped in as a temporary expedient. Most such cases, no fraud was intended. But where such a delinquency formerly would take some time to detect, regional IRS agents have been instructed to start checking.

The first crackdown came after the July 31 filing date, and several million dollars in delinquencies were picked up in New York City alone.

Study Renegotiation

Businessmen have through the end of October to give Congress their views on whether the Renegotiation Act should be extended beyond the end of 1956.

Joint Senate-House Committee on Internal Revenue Taxation is seeking written opinions from businessmen, associations and others as to: (1) whether the act should be extended or allowed to die; (2) whether, if continued, it should be limited in scope, and (3) how present reporting procedures could be simplified to reduce the burden on defense contractors.

The wartime act originally died Dec. 31, 1954, but was extended retroactively last spring for two more years.

Comments should be sent to the Committee on Internal Revenue Taxation, 1011 House Office Building, Washington 25, D. C.

Trusts:

Steel casting group hit in Justice Dept. action.

Five steel casting firms, producing about 85 pct of the steel castings used in the undercarriage of freight cars, are required in an antitrust consent settlement to stop allegedly conspiratorial pricing practices.

Justice Dept. filed a civil antitrust suit and simultaneously a consent settlement decree charging the firms with unlawfully conspiring to hinder and deter competitive manufacturing, using a patent pool, and fixing uniform and non-competitive prices. The firms are also charged with allocating business and dividing world markets between themselves and foreign producers.

Agree to Abide

Involved are the American Steel Foundries, Chicago; The Buckeye Steel Castings Co., Columbus, O.; Scullin Steel Co., St. Louis; The Symington-Gould Corp., Depew, N. Y.; and Foundries Export Co., Inc., New York.

The consent settlement, under which the firms agree to abide by Justice Dept. rules without ad-

WASHINGTON NEWS

mitting any wrongdoing, requires them to grant U. S. manufacturers royalty free licenses under their patents; cancel existing agreements with foreign producers, and selling agents, and set up regulations for future export business.

How to Appeal Taxes

Methods a businessman can use to appeal an incorrect federal tax statement are explained in a new booklet prepared by the Small Business Administration.

The leaflet, "Appeal Procedure for Income Tax Cases" (No. 64), gives detailed explanations of the various steps in the appeal procedure to the Internal Revenue Service and the United States Courts. It is available from all Small Business Administration field offices.

New income tax forms—without multi-colored stripes—have been prepared by IRS and are expected to be easier for taxpayers to fill out. A larger type is used on the tax forms and instructions. Taxpayers are permitted for the first time to round out their figures to the nearest dollar. The forms eliminate the need for taxpayers figuring their own tax to do long division.

Personal income tax deadline next year is April 15.

Probe Pipe Dumping

Businessmen will get a chance to testify at a U. S. Tariff Commission hearing into possible "dumping" of cast iron soil pipe into this country at less than fair value by foreign producers.

The hearing is scheduled to begin at 10 a.m. Oct. 21 at the Commission's office in Washington, D. C. Requests to appear at the hearing should be filed in writing in advance of the date.

Law prohibits foreign producers from "dumping" excess production in this country at less than fair value if domestic firms are injured.



BUILDS EXTRA SELLING POWER INTO YOUR PRODUCTS



THEY buy A.W. STRIP Steel, too! (Hot and cold rolled)

'They' are the people who buy products made with ALAN WOOD strip steel. 'They' are housewives, children, manufacturers—you and I.

Perhaps they can't always see the superior qualities derived through precise, metallurgical control and "custom-production" of strip steel—but they *do* know these qualities must be present—because of the product's strength, dependability and reputation.

If you require strip steel, your

products deserve the "custom-produced" qualities of superior strip . . . for minimum waste . . . less wear and tear on tools . . . easier, faster production. They deserve ALAN WOOD strip steel.

For products requiring hot or cold rolled strip or sheets, call upon the services of a versatile, integrated steel specialist with modern, up-to-date, continuous mills—where steel is produced to your specific requirements—ALAN WOOD STEEL COMPANY.

IRON PRODUCTS

"Swede" pig iron

STEEL PRODUCTS

Plates (sheared)

Hot rolled sheets

Hot rolled strip

Cold rolled sheets

Cold rolled strip

ROLLED STEEL

FLOOR PLATE

A.W. ALGRIP

abrasive

A.W. SUPER-

DIAMOND pattern

A.W. CUT NAILS

MINE PRODUCTS

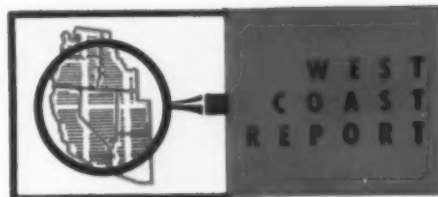
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Why West Sees Big Business Pickup

Need for freight cars spotlights West's late year surge . . . Most industries see big fourth quarter . . . Steel and automotive lead in gains over 1954 . . . More industries plan Western expansion—By R. R. Kay.

♦ Look for an upward trend in business for Farwestern states right to year-end.

If anyone needs more evidence that western industry is booming, freight car needs offer it. Freight agents for West Coast railroads are scrambling like mad to find enough cars to take care of the business.

The West's boom is putting still more heat on the nation's freight car shortage—will undoubtedly cause railroads to pound louder than ever for more steel.

Proof that such pressure is building up can be gleaned from latest estimates on carloading requirements made in San Francisco by Pacific Coast Shippers Advisory Board.

Here are fourth quarter predictions, compared with shipments same quarter 1954.

Big Gains . . . Western steel industry is in the forefront of the upsurge. Shipments of ore and concentrates over Western railroads will zoom 23 pct; coal and coke movements will climb 10 pct.

And here's something that will make steel folks hold on to their hats: iron and steel shipments will skyrocket 47 pct.

Trucks and automobiles to be shipped will be up 87 pct. Vehicle parts, too, will need more freight space—up 18 pct.

Machinery and boiler shipments will rise 12 pct; agricultural implements and parts, 6 pct.

In line with the brisk pace of building on the West Coast, gravel, sand, and stone shipments should fill 33 pct more freight space. Lumber and forest prod-



FIRST 345-kv transformer made by Allis Chalmers dwarfs man in passing test runs.

ucts, too, will add to flourishing business expected from building needs—will take up 17 pct more hauling space.

Need Auto Parts . . . Automotive parts plant to cost \$6.5 million—one of the largest west of Chicago—will open next spring near Los Angeles.

Rheem Manufacturing Co. plans to shift its Vernon, Calif., operation to a 400,000 sq ft plant at Fullerton.

Behind this move:

(1) Zooming West Coast automobile market. Some 600,000 units now assembled here per year—bigger volume to follow. Rheem is gearing its production to cash in on this market.

(2) Plans to step-up output of highway guard rails and farm tools which it sells nationally.

(3) Plans for product diversification. Company spokesmen told THE IRON AGE, Rheem will develop

and make new products. They'll have the space and equipment to handle them.

Feature of the Fullerton facility, which has almost double the Vernon floor space, will be plating lines to cost \$2 million. The new plant will occupy 30 acres of a 59-acre site.

Pipe for Canada . . . Western Canada will get a 100,000-ton-per-year steel pipe plant. It's a \$3.5 million project by Fluor Corp., Ltd., Los Angeles, for its newly-formed affiliate, Prairie Pipe Co., Ltd., near Regina, Saskatchewan. Plans call for the plant to begin production next April. Pipe will go to Canadian oil and gas industries.

More copper from western Washington? Kennecott Copper Corp.'s subsidiary, Bear Creek Mining Co., took an option on a mine near Darrington. Main values of the property, closed down since 1900, are in copper, molybdenum, and silver.

Aircraft Action . . . Will a fighter-bomber, instead of an interceptor, be the next U. S. Air Force combat plane? Word in Los Angeles has North American Aviation, Inc., building the F-107 for the two-purpose job. Power plant may be a souped-up Pratt & Whitney J-57.

United States Hoffman Machinery Corp., New York City, is expanding its aircraft industry operations into California. Firm bought Aerolab Development Co., Pasadena, developers of: guided missiles, supersonic aircraft, target drone planes, rocket engines.



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will help you get highest quality finished parts at increased production rates and lowest manufacturing costs.

It will satisfy exactly your requirement for precise chemical grade and physical characteristics, surface quality, finish and outstanding uniformity—all of which insure best heading performance.

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What's Wrong With British Tools?

Sales in this country lag . . . UK representative hears service and size work against greater interest here . . . Import paperwork discourages many . . . Some misconceptions—By E. J. Egan, Jr.

♦ **GREAT BRITAIN'S** imports of U. S. machine tools exceed its machine tool exports to this country by a considerable margin.

British builders would like to see the situation brought into a more favorable balance. They'd like this to come from an increase of exports to the U. S. rather than from a decrease in the number of American tools shipped into the British Isles.

At the recent Machine Tool Show in Chicago, Mr. W. J. Morgan, general manager of Britain's Machine Tool Trades Assn., told *THE IRON AGE* he was seeking possible solutions to the problem. Mr. Morgan's approach was serious and straightforward.

Tell Me Why . . . He had just one question to ask of anyone he thought might give him a plausible answer: "What reason or reasons can you give for the fact that British builders don't sell more machine tools in America?"

The first answer he received from practically everyone, Mr. Morgan said, was that British-made metalworking equipment was too lightly built and powered for the American taste. Mr. Morgan wouldn't concede that this sweeping generalization was entirely accurate.

Some Are Lighter . . . He admitted that some of the English tools were not as ruggedly powerful (nor as expensive) as their American counterparts. But he said that other British-built machines couldn't be counted out of the competitive picture for this reason.

Where automation is concerned, British metalworking equipment admittedly isn't a logical choice for America's mass-production industries. However, Machine Tool Trades Assn. members aren't particularly interested in this market. They're more concerned about the sales potential here for general purpose machines.

Service Counts . . . The second most common answer to Mr. Morgan's question was that U. S. machine tool buyers liked the idea of quick service on replacement parts. In many cases, the "sales through service" philosophy of major American builders has conditioned buyers to expect and insist on prompt attention to their requests for help.



"You're out of condition. What've you been doing, studying?"

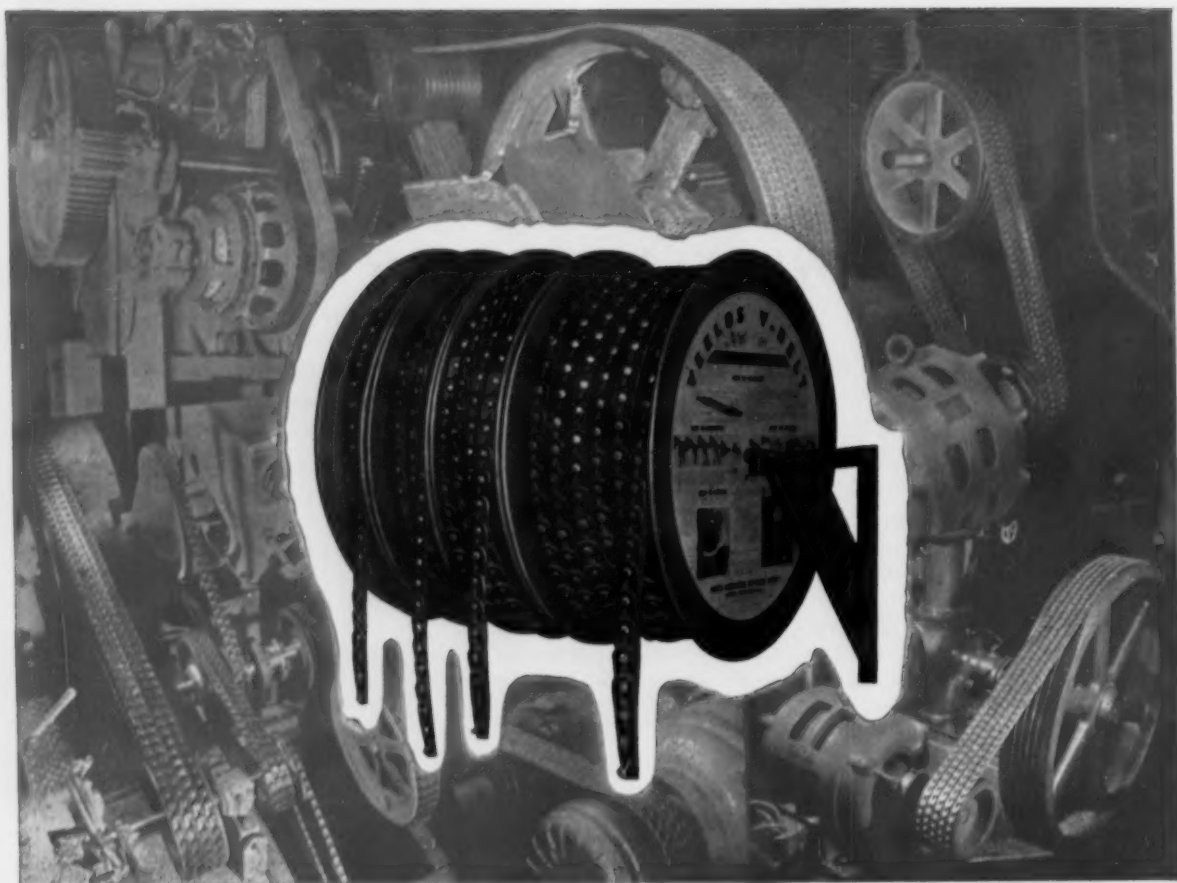
Distributors of U. S.-built machine tools frequently maintain sizable inventories of spare parts, can often send one over in a car to the plant that needs a certain item in a hurry. But even if the distributor doesn't have the particular part on hand, overnight shipment, or an air express package from the factory can almost always be counted on.

Fear Long Wait . . . By way of contrast, the common American impression is that necessary repairs to foreign-built machine tools would almost inevitably mean longer downtime periods, serious interruptions in production schedules.

Feeling seems to be that replacement parts for such machines could not be stocked very heavily here, also that trained field and service engineers would not be readily available. Such service needs would have to come "all the way" from overseas.

Point to India . . . Countering this objection, Mr. Morgan pointed out that this quick-service problem didn't altogether square with the facts as British builders see them. He said that English firms had long sold machine tools to such far-off countries as India and Australia, and that the matter of prompt service had never seemed to affect sales adversely.

At the sales and distribution level, Mr. Morgan received still another answer to his question. This was that U. S. distributors, in the Midwest particularly, tend to be overwhelmed by the idea of the paperwork for importing.



THIS *one* V-BELT INVENTORY keeps your drives on the go

Take a look at the illustration above—there's a complete v-belt inventory. Those four 100-foot reels of Veelos—the adjustable v-belt—in the O, A, B and C widths can replace up to 316 different sizes of endless v-belt. Of course, when you use only one or two widths of v-belt, you stock reels of only those widths. This 4-reel Veelos v-belt inventory is easy to maintain, stores in a space only 16 inches square, and is ready when you want it.

But inventory saving is just a part of the Veelos story.

Veelos adjustable v-belt is *easier to install*—in many cases installation is completed in 50% to 90% less time.

Using Veelos means you don't have to re-set motors or remove outboard bearings. Veelos v-belts provide *vibrationless, full power delivery*. A demonstration on an electronic vibration analyzer will show you and prove to you that Veelos v-belts *reduce vibration up to 90%!*

Switch to Veelos adjustable v-belt—the one v-belt that keeps your drives on the go. See your Veelos distributor. Write for your copy of the facts-packed Veelos Data Book.



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ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Veelos is packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.

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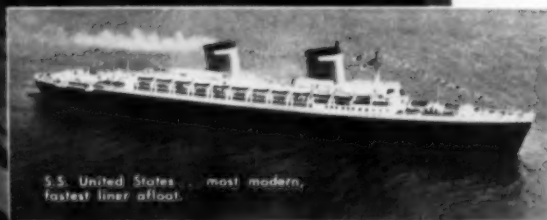
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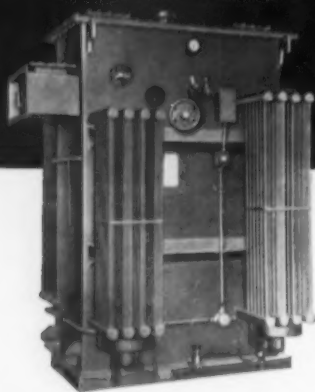
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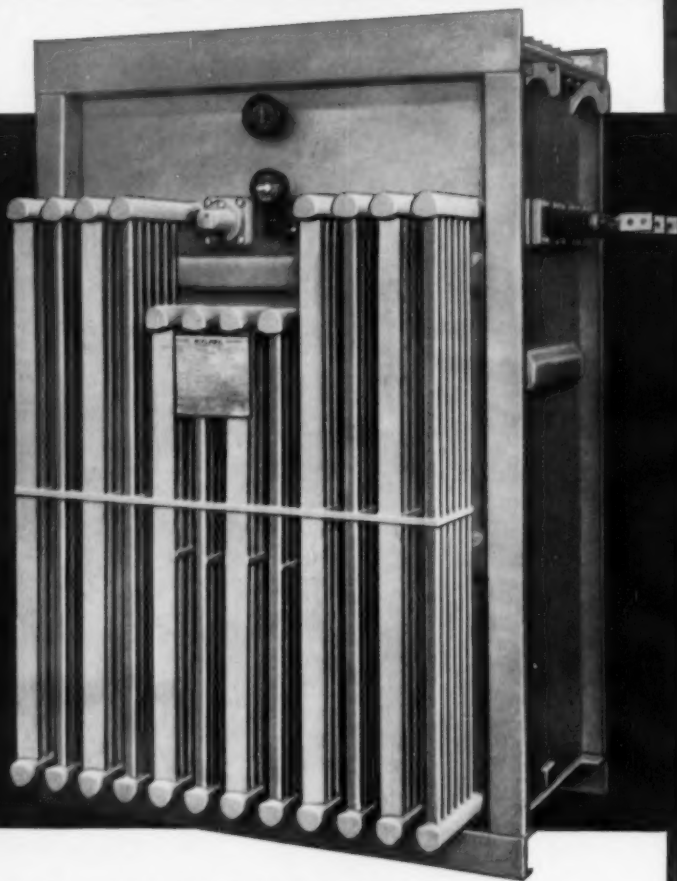
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load centers...
specify Wagner
Close-Coupled
Unit Substation
Transformers



Wagner

THROAT-CONNECTED UNIT SUBSTATION TRANSFORMERS

For outdoor installation, or for applications where it is desirable to locate the transformer away from the switchgear, Wagner can furnish these liquid-filled transformers in ratings to 2000 kva, 15 kv and below. Bulletin TU-13 gives full information.



Now, Wagner liquid-filled unit substation transformers are available in new, improved close-coupled units, rated from 300 to 2000 kva, that can be flush-mounted with any make of switchgear. They can be used in both single and double-ended unit substations to form neat, compact, streamlined substations for modern industrial service.

Bushings are provided on the ends of the close-coupled transformer for connection to the switchgear. The bushing heights are designed for a minimum distance from the base, giving ample room to make connection to switchgear or busses in the switchgear compartment or transition section.

In this type design it is not necessary to coordinate bushing height of transformer and switchgear as in the throat connected units which often require special throat heights to match special switchgear. This feature means that a standard transformer can be used for special switchgear application with a minimum of engineering coordination, resulting in shorter deliveries.

Look to Wagner for better transformers that assure a continuous, dependable flow of power. Your nearby Wagner engineer will be glad to help you solve your load-center problems. Call the nearest of our 32 branch offices, or write us.



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The Iron Age

SALUTES

Dorothy M. J. Tracey

Sound technical and business judgment brought her to the top of a 38-year-old metalworking firm. She can spot good people; she has fostered a spirit of warm company fellowship.

Eyebrows went up when Dorothy M. J. Tracey was made purchasing agent of The Tomkins-Johnson Co., Jackson, Mich. The company makes air and hydraulic cylinders, clinchers, die sinking milling machines and other unfeminine items.

But Mrs. Tracey quickly showed the ability to cope with man-sized problems. She not only handled the job but demonstrated a capacity for higher things. In 1943 she was made general manager at Tomkins-Johnson. Last year she became president of the 38-year-old firm.

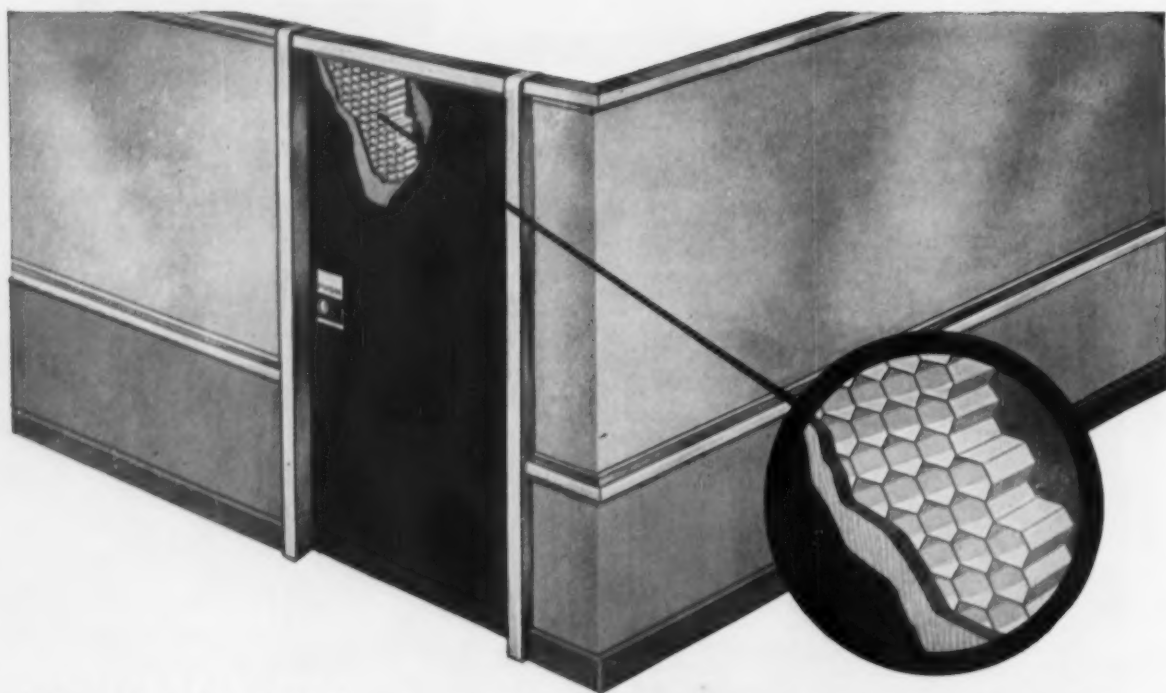
Evidence of Mrs. Tracey's executive competence is found in bustling company activities under her leadership. New air and oil cylinders, a new reamer and a leading spot in production of die sinking milling cutters indicate she knows how to keep the wheels turning.

Partly this achievement is a tribute to Mrs. Tracey's knowledge and judgment along technical lines. She knows her lathes and drill presses. Partly it stems from her ability to

spot good people and bring them into the company. Last and perhaps most important, she instills a healthy team spirit in associates at all levels.

This extra lift shows up in things like bowling nights. At Tomkins-Johnson, wives, husbands and children turn out at the alleys. During work hours and on the outside there is a company fellowship that reflects Mrs. Tracey's warm personality. She is a woman who moves comfortably in business and technical circles but there is nothing cold or grim in her manner. Her success is strictly a question of ability but her charm does make things nicer. At picnics and other company outings, she is a gracious addition.

Mrs. Tracey likes air travel, flies to business meetings all over the country. She is fond of dogs, specializing in boxers, and is a boating enthusiast. When she is not on duty at Tomkins-Johnson, she takes many trips throughout the Great Lakes on her 40-foot Chris-Craft. All in all, she leads a full, active life.



Marvinol vinyl's beauty and practicality now in... the honeycombed Kameer door vinyl-laminated by the **Marvibond** process

Your doors are usually the visual focal point of inquiring visitors, and at the same time, the gateways through which they must pass—opening and closing, pushing and pulling. Because of this, Kameer* now adds the beauty and practicality of Marvinol[®] vinyl to its functional triple-strength door. The vinyl is permanently bonded to the metal by the MARVIBOND[†] process, Naugatuck's exclusive technique for laminating vinyl to most metals.

Marvibonded metals offer the full, rich colors of vinyl in practically any surface effect—smooth or matte finishes, leather-like grains, marble patterns, prints, weaves, or other embossed finishes. And the Marvibond process adds to the strength, rigidity, and formability of metal, the abrasion resistance, chemical resistance,

and weather resistance of vinyl... Marvinol vinyl which will not chip, scratch, or peel... nor support combustion. And, scuff-marks, fingerprints, and stains wipe off with a damp cloth.

Marvibonded metals are now being produced on a continuous production basis. Laminated before forming, they can be fabricated by all standard metal working tools—even deepdrawn without fracture or loss of adhesive bond.

If you are using sheet metals that have to be finished, or that would have added sales value if they were, why not investigate what Marvibond has to offer? **For samples, technical data, and the location of licensed laminators, please write to us on your company letterhead.**

[†]Patent applied for

*Kameer Company, Architectural Products Division, Niles, Michigan



Naugatuck Chemical

Division of United States Rubber Company
Naugatuck, Connecticut



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The Iron Age INTRODUCES

Robert B. Murray, Jr., elected vice-president and board member of the **Baldwin-Lima-Hamilton Corp.**, Philadelphia; **James M. White**, vice-president, manufacturing; **Colonel John R. Martin**, appointed vice-president, electronics and instrumentation.

H. Wayne Aden, named controller, **Link-Belt Co.**, Chicago.

John W. Becker, named manager, Syracuse district, **Allis-Chalmers Mfg. Co.**, Milwaukee.

George B. Meyer, appointed manager of defense products, **Westinghouse Electric Corp.**, Dayton, O.; **Admiral Robert B. Carney**, named consultant, Pittsburgh; **Romus Soucek**, manager of defense products, West Coast.

Peter B. Davies, elected assistant sales manager, **Philadelphia Gear Works**.

William W. Crawford, appointed assistant director of purchases, **U. S. Steel Corp.**, Pittsburgh; **Everett G. Barrett**, named purchasing agent, electrical and mechanical equipment.

J. S. Betterton, manager, Special Construction Products Sales Div., **Wheeling Corrugating Co.**, Wheeling, W. Va.

Fred C. Lange, appointed manager of Chicago Works, **Bethlehem Steel Co.**, Chicago.

James H. Bechtold, named manager, metallurgy dept., **Westinghouse Research Laboratories**, Pittsburgh.

Howard D. Kurt, named product planning specialist, Distribution Assemblies Dept., **General Electric Co.**, Alton J. O'Neil, named marketing research specialist, Plainville, Conn.

Arthur P. Siewert, appointed superintendent, Grey Iron Foundry Dept., and **Ralph Anderson**, named plant metallurgist, Central Foundry Div., **GMC**, Danville, Ill.; **Benjamin S. Head**, elected superintendent, Finishing Dept., Defiance, O.

David M. Roney, Jr., named administrative assistant, **Hanson-Van Winkle-Munning Co.**, Matawan, N. J.

Albert W. Large, appointed sales representative, **Henry Disston & Sons, Inc.**, Philadelphia.

Lewis W. King, promoted to assistant to vice-president, engineering, **Birdsboro Steel Foundry and Machine Co.**; **Ralph H. Scholl**, manager, Roll Dept.

PERSONNEL



HENRY M. HEYN, elected vice president, **Surface Combustion Corp.**, Toledo, O.



ALBERT L. HOLLINGER, elected vice president, **Surface Combustion Corp.**, Toledo, O.



WILLIAM E. FOWLER, elected vice president, **Youngstown Sheet & Tube Co.**



HERMAN J. SPOERER, elected vice president, **Youngstown Sheet & Tube Co.**

October 13, 1955

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PERSONNEL

Walter C. Stoner, elected assistant superintendent of industrial relations, Republic Steel Corp., Youngstown.

Orvin A. Klema, elected chief metallurgist, Bristol Brass Corp., Bristol, Conn.

Dr. Samuel Zerfoss, appointed chief, Refractories Section, National Bureau of Standards, Washington.

C. Irwin Hochhaus, appointed plant manager, Penco Products Div., Alan Wood Steel Co., Conshohocken, Pa.

J. S. Gillespie, named manager, Diamond Project Section, Carboloy Dept., General Electric Co., Detroit.

Edward F. Jennings, appointed New York District sales manager, Laclede-Christy Co., Div., St. Louis.

Edward C. Norris, Jr., appointed assistant superintendent, industrial relations, Republic Steel Corp., Cleveland.

Phillip Hermann, appointed supervisor, Technical Services Div., Jones & Laughlin Steel Corp., Pittsburgh.

Robert J. Rodwell, elected manager of finance, General Electric, Schenectady; Robert W. Sullivan, named senior metals processing engineer.

Andrew Kalitinsky, appointed manager, Nuclear Research and Development, Convair Div., General Dynamics Corp., Fort Worth, Texas.

John Veckly, appointed assistant director, administration, Advertising Div.; Robert J. Wilcox, appointed assistant director, Industrial Advertising, and Harold W. Hoffman, appointed assistant director, General Advertising, U. S. Steel Corp.



JOHN W. BUSKIE, elected vice president, Tenn-Tex Alloy & Chemical Corp., Chattanooga.



ROBERT D. FLEISCHER, appointed sales manager, Safety Tool Div., Beryllium Corp., Reading, Pa.



ROBERT A. DAGGIT, appointed assistant manager, sales, Chicago plant, Joseph T. Ryerson & Son, Inc.



HOMER E. RIEKER, appointed manager of sales, Cleveland steel service plant, Joseph T. Ryerson & Son, Inc.



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Robert Smith, vice-president, sales, Hy-Pro Tool Co., New Bedford, Mass.

C. L. Peterson, appointed vice-president and general manager, Brown Instruments Div., Minneapolis-Honeywell Regulator Co.

Lloyd T. Smith, appointed manager, Competitive Analysis Dept., Tractor and Implement Div., Ford Motor Co., Birmingham, Mich.

J. D. Weatherford, appointed western district sales manager, Houdaille-Hershey of Indiana Inc., Indianapolis, Indiana.

E. M. Deckman, appointed commercial sales manager, aircraft engines, Allison Div., General Motors Corp., Indianapolis.

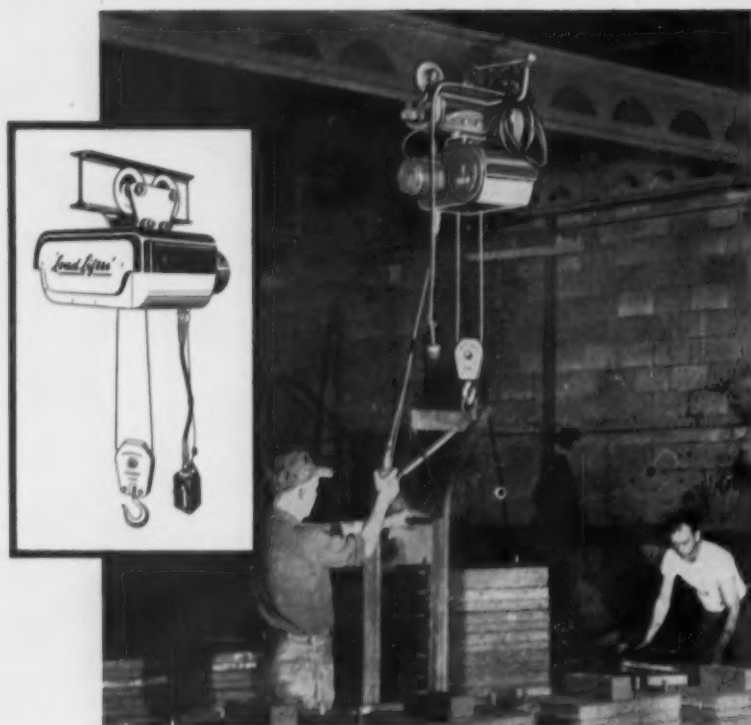
John E. Meroney, named district manager, St. Louis, Penn Metal Co., Inc., New York.

James B. Carse, appointed marketing manager, H. M. Harper Co., Morton Grove, Ill.

Chester J. Nowak, appointed plant superintendent, Wagner Brothers Equipment Co., Detroit.

G. I. Sundstrom, appointed assistant general manager; **Melvin Isaacson**, named general sales manager, and **John G. Rombough**, industrial relations manager, Metals Processing Div., Curtis-Wright Corp., Buffalo, N. Y.

W. J. Wottowa, elected vice-president, Samuel G. Keywell Co., Inc., Detroit.



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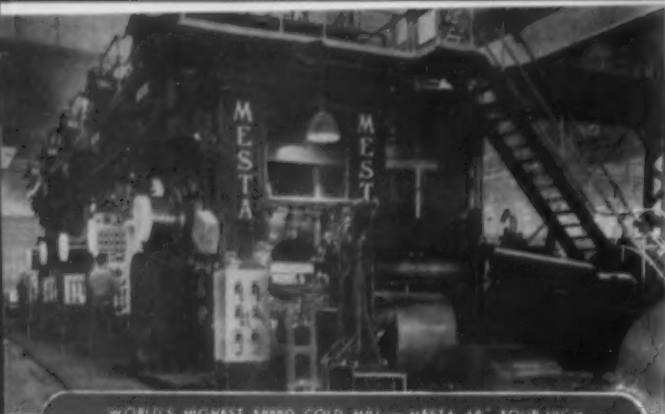
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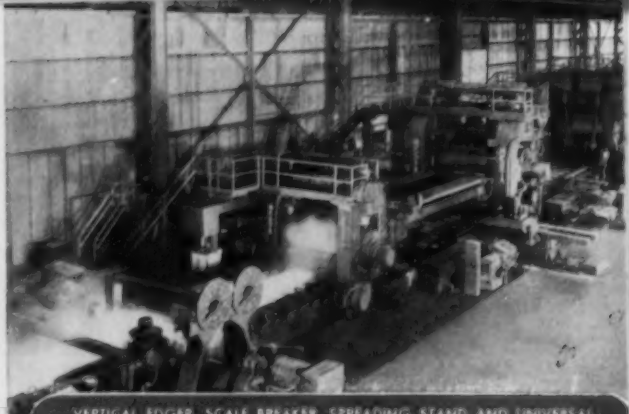
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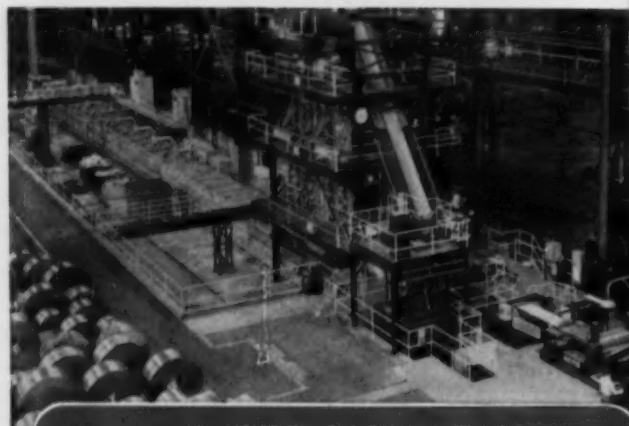
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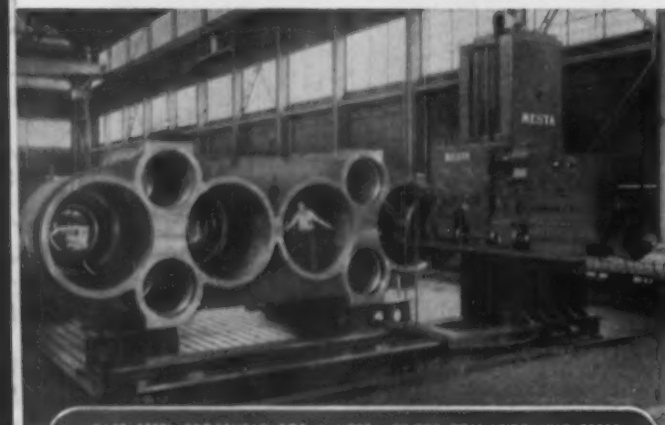
VERTICAL EDGER, SCALE BREAKER, SPREADING STAND AND UNIVERSAL STAND ON A MESTA 80" CONTINUOUS HOT STRIP MILL



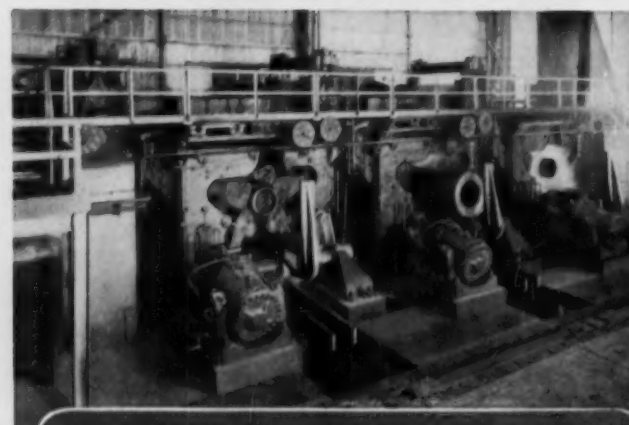
MESTA 80" FOUR-HIGH CONTINUOUS HOT STRIP MILL FINISHING STANDS



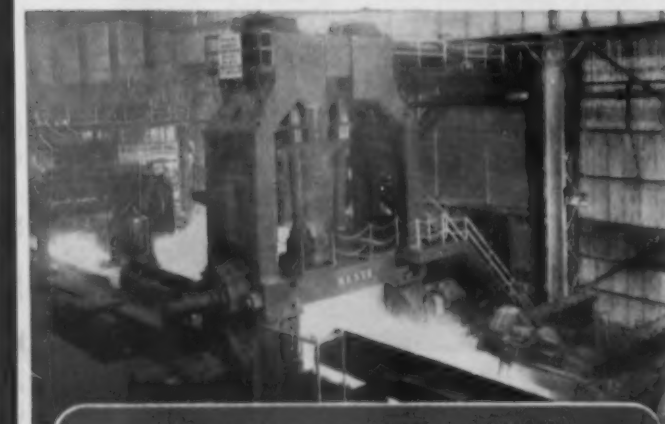
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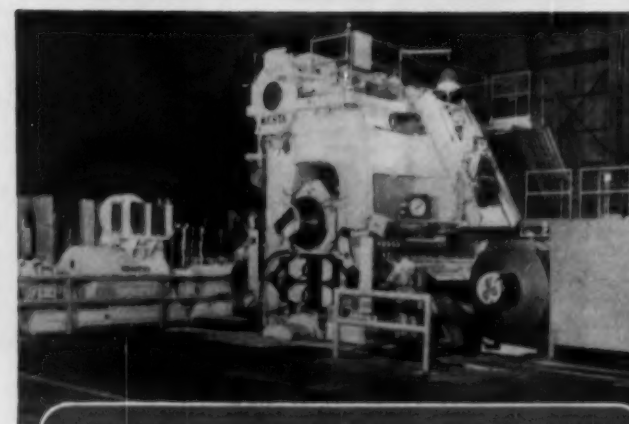
CAST-STEEL CROSSHEAD FOR A MESTA 50,000 TON HYDRAULIC PRESS MACHINED ON A MESTA 18" HORIZONTAL BORING AND MILLING MACHINE



THREE DOWN-COILERS ON A MESTA 80" CONTINUOUS HOT STRIP MILL



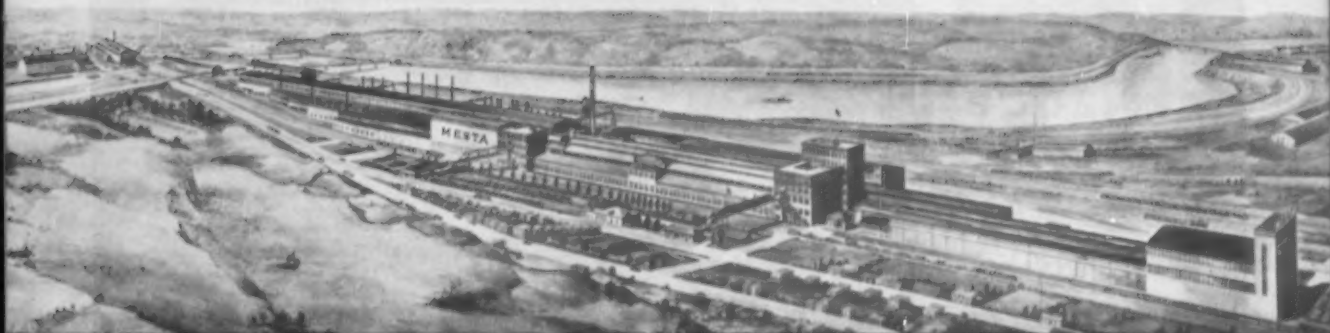
MESTA 45" x 90" UNIVERSAL REVERSING SLABBLING MILL



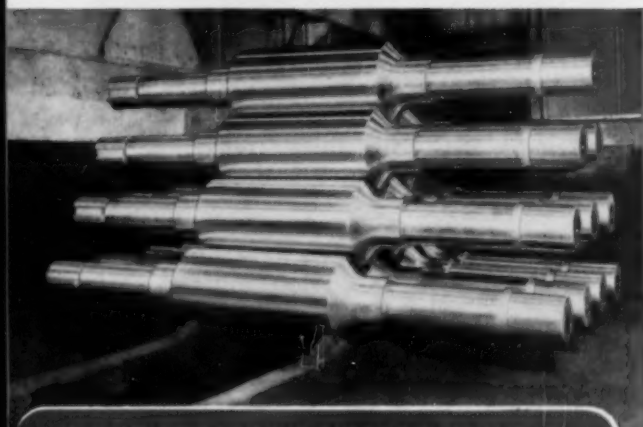
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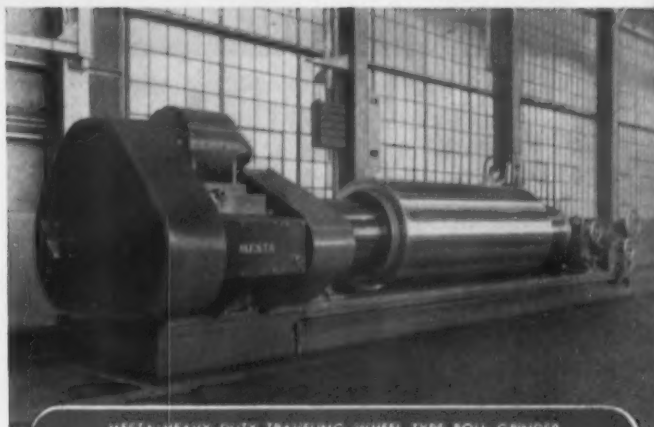
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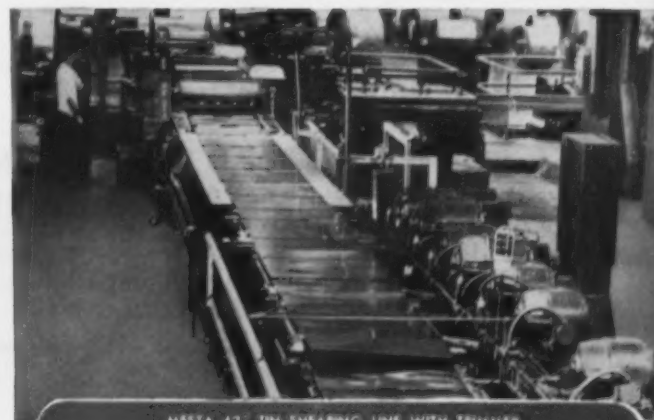
FORGED HARDENED ALLOY STEEL WORKING ROLLS FOR COLD MILLS



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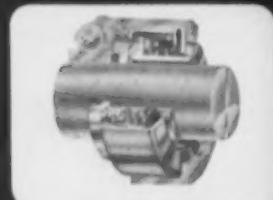


MESTA 42" TIN SHEARING LINE WITH TRIMMER
AND COMBINATION FLYING SHEAR AND LEVELER

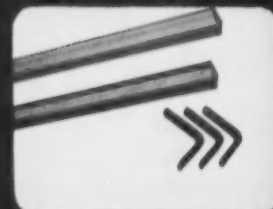
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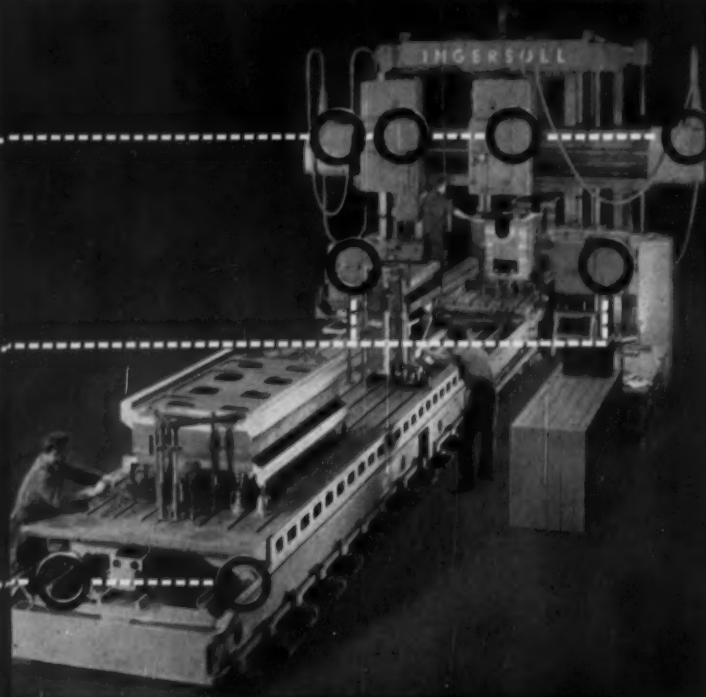
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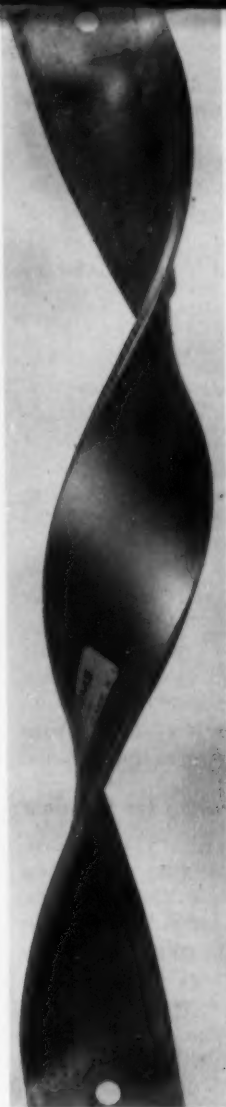
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**On aluminum,
titanium, steel—**



New Chrome Plating Process Deposits Highly Ductile Coatings

◆ Heavy, dense hard-chromium deposits can be plated directly on aluminum by a new process which gives exceptional intermetallic bonding strength . . . Deposits are highly ductile, providing high resistance to distortive bending, and torsional and impact loading.

◆ Hard-chromium plate on titanium sheet withstood forceful punching without chipping or peeling . . . Deposits can also be applied to carbide, cold-rolled steel, zinc alloys, lead alloys, beryllium-copper and tungsten.

FIG. 1—Severe bending and twisting of chromium plated 52S aluminum strip demonstrates coating's tight adherence and ductility.

By P. J. TOPELIAN, Vice President,
Research & Development, Tiarco Corp., Clark, N. J.

◆ **HIGHLY** ductile and adherent deposits of chromium have been applied to aluminum, both cast and wrought forms, by a new plating process. The coatings withstand severe bending and high impact loading without chipping, peeling or flaking. The development is the result of work done by the Tiarco Corp., Clark, N. J. In addition to this Hardalume process, the firm has also developed techniques for plating chromium on titanium, cold-rolled steel, zinc alloys, lead alloys, beryllium-copper and tungsten carbide.

The Hardalume process is noteworthy be-

cause (1) the chromium, though heavy, hard and dense, is ductile; and (2) the bond between the chromium layer and the aluminum is stronger than has hitherto been attained. The chromium layer is bonded directly to the aluminum without any other intervening or extraneous metal to form undesirable electrolytic couples.

Fig. 1 illustrates the coating's exceptionally strong adhesion and the unusually high resistance to distortive bending as well as torsional and impact loads. It shows a strip of 52S aluminum, $\frac{1}{8}$ in. thick, $1\frac{1}{2}$ in. wide and 12 in. long



FIG. 2—Tubing distorted in vise cracked the underlying aluminum, but the 0.014 in. thick chromium plate did not peel or flake.

which was processed to provide a hard chromium layer 0.003 in. thick. The strip was twisted to subject the aluminum-chromium composite to a substantial torsional load. Though the chromium layer and the bond at the interface between the two metals were thus subjected to high tensile and shearing stresses, there were no signs of cracking or peeling of the chromium.

In another test 52S aluminum tubing, 3/32 in. thick and having an outer diameter of 1½ in., was processed to a thickness of 0.014 in. of chromium. The tube shown in Fig. 2 was then placed in a vise and pressure applied to distort it. Despite this extremely destructive test, and though the surface layer of chromium was extremely thick, cracking appeared only because the underlying aluminum cracked. The chromium did not peel or flake.

Coating highly ductile

To further demonstrate the coating's adherence, a strip of 3S aluminum ⅛ in. thick was plated with a layer of hard chromium to a thickness of 0.003 in. The aluminum-chromium composite was then subjected to high energy impact loads by striking with a ¾ in. chisel and the ball end of a hammer so that the deformation, or resulting indentations made by the tools, exceeded the thickness of the chromium layer at least five-fold. The chromium layer was ductile enough to flow with the underlying aluminum without any signs of cracking, chipping or peeling, as Fig. 3 illustrates.

Another significant feature of the process is that a uniform thickness of chromium is deposited even in areas which are sharply projecting and adjointly recessed. The normally poor throwing power of chromium plating baths often results in "treeing" or projections. The Hardalume process avoids "treeing" so that parts such as the one shown in Fig. 4, which have abrupt changes of section, are provided with a layer of chromium of uniform thickness, thereby providing resistance to local stresses.

An engraved aluminum printing plate which was processed to provide a surface layer of chromium 0.001 in. thick, made 18 million impressions of excellent clarity. Moreover, engraving the stainless steel was slow, laborious and very costly.

Works well on irregular shapes

The aluminum pattern in Fig. 4, which is used in shell casting, was processed to give it a surface layer of chromium 0.003 in. thick. Despite its irregular contour, the chromium surface is sharp and clear. This piece, which is subjected to abrupt thermal changes, is a highly successful application of the process.

Titanium's light weight, and its excellent resistance to heat and corrosion have made its use highly desirable for a variety of industrial applications. However, it is deficient where a low coefficient of friction is necessary, such as for pistons, cylinders, cams, shafts and gears. A titanium surface actually seems to exhibit adhesive characteristics, and even in the case of light loads, galling or seizing occurs. Furthermore, titanium presents a surface which does not accept a chromium deposit readily.

Improved coating for titanium

After extensive research, the Tiarco Corp. has also developed a technique, called the Baylig process, for electrodepositing chromium directly on titanium. The bond between the metals is so strong that the composite effectively withstands the rigors of usages which involve severe mechanical abrasion and distortion.

Titanium sheet (Mallory-Sharon 49019) 1/16 in. thick was plated with chromium to a thickness of 0.001 in. in accordance with this new process. After processing, the sheet was subjected to severe bending. No cracking, chipping or peeling of the surface layer occurred.

In another test, a titanium strip (RC-70) 1/16 in. thick was plated with a chromium surface



FIG. 3—Ball peen hammer blows and chisel marks failed to crack, chip or peel this 0.003 in. thick layer of hard chromium on aluminum.



FIG. 4—The Hardalume process, among other features, has exceptional throwing power. It gives uniform deposits even in recessed areas.

layer 0.002 in. thick. The chromium-titanium composite was forcibly struck with a prick punch to the extent that the punch passed entirely through the composite.

In spite of this high energy impact load, involving tensile, compressive and shearing stresses of unusually high magnitude, the chromium was sufficiently ductile and the bond sufficiently strong so that no chipping or peeling took place as may be seen in Fig. 5. The chromium actually conformed with the underlying titanium in the area of distortion.

In still another test, a piece of titanium tubing (150A) of $\frac{3}{8}$ in. diam and $\frac{1}{16}$ in. thick was plated with chromium to a thickness of 0.005 in. It was then subjected to a high speed buffing wheel with a polishing compound. The piece was held to the wheel for five minutes at one spot, becoming exceedingly hot. There was no chipping or flaking of the chromium and the result was a mirror-like finish of exceptional smoothness.

Withstands high temperature

The Baylig process has also been used to apply hard chromium to titanium pistons for a defense weapon involving extremely high temperatures and severe abrasion. Field tests have indicated excellent durability of the part.

The process for depositing hard, dense and ductile chromium of uniform thickness on aluminum parts is equally applicable to cutting tools, punches, dies and gears. This technique is known as the Sure Wear K process. By plating the sharp teeth of a steel metal-cutting saw

with a 0.005 in. thick hard chromium deposit, not only was the sharpness of the teeth maintained, but the saw had 500 pct longer life.

This ability to conform the chromium surface layer to the sharply irregular underlying surface is also demonstrated on a high-speed 13/16 in. railroad reamer. Its cutting edges were surfaced with 0.002 in. of hard chromium which increased tool life by 400 pct.

Gear life greatly extended

The process has been applied to gears where the teeth of a fine-pitch phosphor-bronze gear segment were plated with 0.001 in. of chromium. A smaller mating gear of stainless steel had its teeth surfaced with 0.0004 in. of chromium. The life of these gears has been extended many fold by hard chromium surfacing.

By another technique, known as the Kromoloy process, standard steel files were plated with chromium. Extensive tests have proven that the processed files have a life three times longer than uncoated files. Furthermore, the treated files are non-clogging and rust resistant.

The Tiarco Corp. has also been successful in depositing heavy, hard, dense and ductile chromium with tight adherence on base metals of cold-rolled steel, zinc alloys, lead alloys, beryllium-copper and tungsten carbide. A heating element of cold-rolled steel, plated with 0.0005 in. of chromium, withstands high temperature for extended periods of time.

In another application, a gear diecast of Zamac receives a chromium surface layer 0.001 in. thick. Use of the process has been successful in prolonging the life of printing plates formed of zinc and lead alloys.

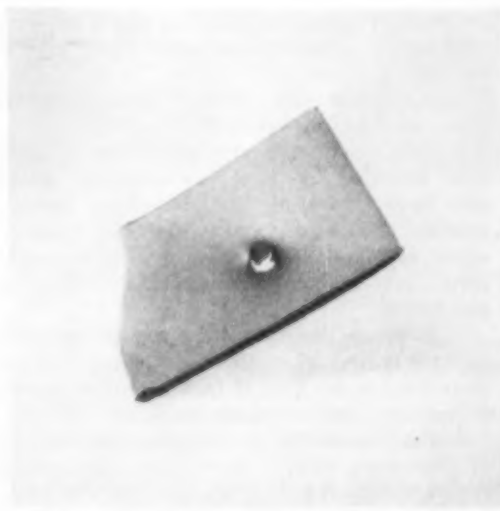


FIG. 5—A punch driven through this chromium plated titanium sheet failed to chip or peel coating. It simply conformed to punch mark.

Simplify Sectional Dies to Save Material and Labor

♦ COMPARED WITH DIES made from solid blocks of steel, sectional dies are often simpler to make. As added benefits, they frequently offer considerable savings in material and labor.

The field of application of sectional dies extends to blanking, punching, cutting off, bending, forming and drawing. It also applies to ordinary and compound construction; to single operation or progressive die forms; to simple or complex contours; and to small or large openings. It is not limited to dies alone but also includes punches.

Major advantages derived from sectional construction of dies include:

1. Fast and inexpensive machining of intricate blanking or punching contours which may have projecting portions, sharp corners, grooves, recesses and awkward angles. Furthermore, sectional dies, in contrast to one-piece forms, usually require a minimum of hand filing and fitting.
2. Accurate dimensions for the die openings because individual sections can be machined to close tolerances. Also, if heat treatment causes distortion, it can be readily corrected.
3. The possibility of changing the contours of press tools quickly when limited production runs are involved. New die sections can often be substituted to change shapes and dimensions.
4. The ease and economy with which damaged, defective, or worn die sections can be replaced, repaired, or otherwise corrected.

♦ One-piece dies are often difficult to machine from a solid block of steel, usually require much hand filing and fitting . . . Use of sectional dies can frequently solve these problems.

♦ But proper design of these sectional tools is important for accuracy, long life and easy maintenance . . . Here's a wealth of helpful information on composite die design, construction and use.

By FEDERICO STRASSER,

Consultant, Santiago, Chile

5. Convenience for heat treating, especially on certain contours that would, in solid die blocks, be impossible or difficult to harden because of the danger of distortion or cracking.

6. The savings on large dies where only the active parts need to be made from expensive materials, so that the rest of the tool can be formed from mild steel or even cast iron.

7. Height of the sectional die proper is not a limiting factor as with solid dies where it is difficult to hand-work narrow, small openings in thick steel plates. Consequently, sectional dies can be built to have more steel available for regrinding, thus giving them longer life.

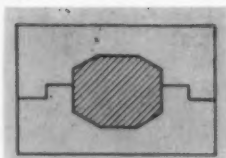
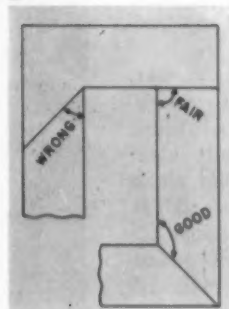
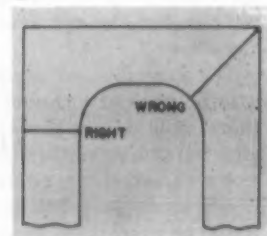
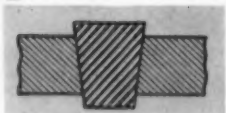
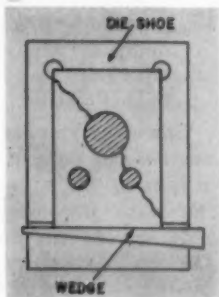
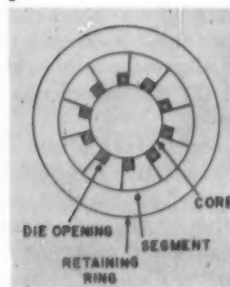
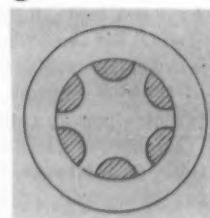
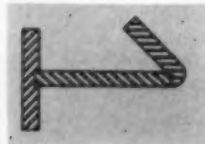
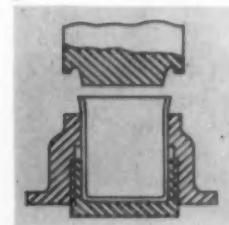
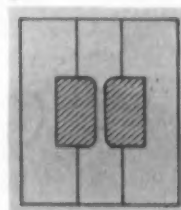
8. Maintenance of these built-up dies is easy, quick and inexpensive.

Use inexpensive frames

A rather large field of application for sectional dies is represented by the stamping of laminations. In a simple case of a punching die for slotting armature disks, the die proper is made by enclosing two symmetrical half-dies in a die holder ring.

A variation of this construction occurs where the cutting edges of the slots and other openings are formed in a separate core section which is press-fitted into a retainer such as an inexpensive ring or a rectangular frame.

Other sectional dies also have these external rings and central cores, but differ in that the active die openings are fashioned in segments

A**B****C****D****E****F****G****H****I****J**

A) STEPPED sections are best for rigid locking.

B) OBTUSE included angle on die section is best.

C) MAKE section breaks outside the arc to avoid machining two hard-to-match curved segments.

D) HARDENED, tapered insert is long to permit final grinding flush with die plate surfaces.

E) BROKEN one-piece die salvaged by wedging parts tightly within an inexpensive steel frame.

F) DIE segments held between a solid core and a retaining ring can be easily replaced.

G) CUTTING edges are machined in the core which is then press-fitted within the ring frame.

H) SECTIONAL punches save material and time, also solve many a tricky hardening problem.

I) TELESCOPING sectional die can be set-screw adjusted to produce shells of varying heights.

J) THREE easily made sections solve the problem of a narrow bridge in a large die opening.

that are inserted between the frame and the core. Here, since the external frame serves only to hold the die segments together, it is generally made of inexpensive mild steel.

With composite dies it is often possible to use the basic die sections for producing more than one type of workpiece. For example, using supplementary fillers, the same die might be used for punching longer, shorter, narrower or wider slots.

The principles of sectional construction may also be applied to punches, although as a rule these tools do not present the same machining and hardening difficulties as composite dies. But where making a punch from a solid block would mean an expensive waste of material, it would be preferable to produce it in sections.

Furthermore, the upper part of the punch (including the shank) might well be made of cast iron or mild steel, with only the bottom or cutting section to be fashioned from a comparatively thin, hardened plate of tool steel.

Design and construction procedures for sectional dies are generally similar to those used for solid tools, but certain special characteristics of the sectional types must be considered. Most important are (1) alignment and locking of the die sections, and (2) the subdivision of the die-opening contours.

Regarding alignment and locking of die sections or segments, it is imperative to eliminate any possibility of shifting. This may be done in various ways, depending on the die opening, shape, size, cutting pressure and other operating conditions.

The most common and most widely used locking devices are dowel pins and bolts which locate and clamp the sections to the die shoe. Quantity and size to be used in any given die depends on the cutting pressure, but their location is also important.

Put bolts near cutting edges

Bolt holes should be located near the cutting edges to give greater stripping strength. Good practice is to put threaded holes in the die sections and locate bolt heads in the die shoe. Dowels may be placed for convenience but should be as far apart as possible.

Sections for heavy duty dies, intended to work on thick stock with heavy cutting pressures, should be sunk deep in the die shoe. This can be done by fitting them into grooves or other recesses and locking them securely with pressure screws, wedges, keys, etc. In very large dies, sections may be held together with tie rods.

Although cylindrical and tapered pins, rectangular plugs and double dovetail plugs may be used to lock die sections in good alignment, the most efficient method is to make interlocking or stepped sections in themselves. This creates rigid dies similar to one-piece forms.

Sectional design that must subdivide, or "break" or "split" the die opening contour calls

for experience and ingenuity. However, some basic rules can frequently be applied to these problems.

For example, the center line (symmetry axis) should be the parting line to make both die halves exactly alike. And for irregular contours, each die section should be as simple as possible (straight lines or arcs with large radii) to avoid machining and heat treatment difficulties.

Contour breaks are usually made at sharp corners of the die opening. The included angle on the die section should never be an acute one; a right angle is all right but an obtuse angle is best. Also the breaks should not be made in a corner where there is an arc, but should be kept outside the arc. Thus only one curved corner need be machined instead of two, and matching of the die members is accomplished more easily. If a break on a curve cannot be avoided, the parting line should be made at right angles to the curve's tangent line.

Duplicate segments speed repairs

If die sections can be made symmetrical it is often possible to machine them simultaneously. A supply of duplicate segments made in this way also simplifies the job of replacing a broken or chipped section.

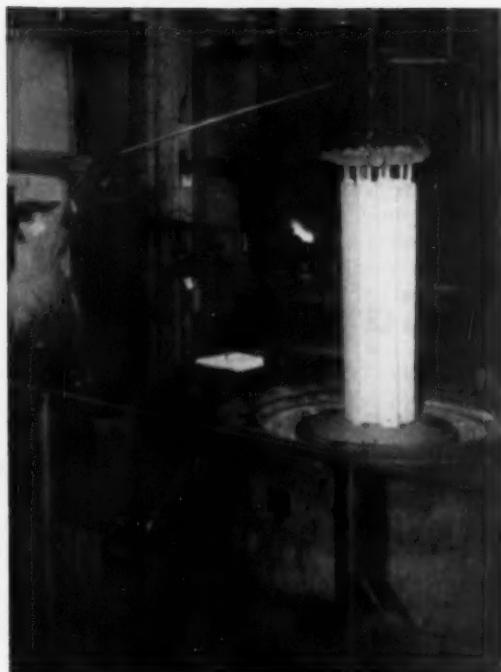
Since the manner in which heat treated die section may deform cannot always be predicted, it is advisable to taper the insert opening in the die plate. Recommendation is one degree per side upward and outward from the bottom of the die. The insert should be adjusted so that it projects about 0.04 to 0.06 in. above and below the die plate before it is hardened. After hardening it can be put in place and ground flush with the surrounding area.

To fit die sections together most efficiently, and to reduce grinding and lapping, the actual land or contact surfaces should be kept small, with proper clearance between the remaining adjacent areas. But where mica or aluminum is to be blanked, the entire area of the abutting surfaces should be carefully lapped and fitted together to prevent small particles of stock from getting between the die sections to wedge them apart.

Another important rule is that where both the punch and the die are made by the composite method, the joints of the punch sections should not coincide with those of the die sections.

The sectional die principle can often be used advantageously in the repair of solid die blocks that become damaged. It is usually sufficient to build a proper support base for the broken parts and unite them thereon just as though they were specially made die sections. This technique has been used successfully to salvage dies that have been damaged by erroneous heat treatment, by mistakes in setting the die in the press, and by various other causes.

Material change—



FABRICATED NICKEL ALLOY retort in this furnace has first service life of 12 to 15 months.

◆ **IMPROVED FABRICATING METHODS** and use of Inconel have doubled the service life of furnace retorts. Repair possibilities extend their usefulness still further.

The Bullard Co., Bridgeport, Conn., found that fabricated Inconel retorts used in six pit-type carburizing furnaces deliver twice the service life over the fabricated retorts formerly

Prolong Service Life of Furnace Retorts

used. The service life of these retorts has been extended an additional 50 pct by sending them back to the fabricator for welding in new sections when needed. This practice is followed because failures usually buckle the bottom, leaving the rest of the retort in reasonably good shape.

Retorts are fabricated by Rolock, Inc., Fairfield, Conn. Up to 84 in. deep and 28 to 36 in. in diameter, they are made by welding sheet Inconel onto a cylinder of proper length, then welding on a dished, drawn bottom section which eliminates corner welds. Proper fabrication is important in extending service life.

An important application for the gas-tight jackets at Bullard is in heat-treating gears used in automatic boring, milling and drilling machines, vertical turret lathes and vertical chucking machines. Retorts are operated two shifts per day at 1700°F.

Inconel was chosen for use in replacement retorts because of its high strength at elevated temperatures and ability to resist carburization and other heat-treating atmospheres. First replacement retorts averaged 12 months' service.

For a short time, a substitute alloy of lower nickel content had to be used. Fabricated retorts of this material gave up to 6 months' service, against a 3 to 4 month average for the original units. In a more recent installation, the first of six fabricated Inconel retorts is still in service after 20 months. All carburizing furnaces are now fitted with these retorts.



WELDING on replacement section extends retort life by an additional 50 pct.

Ingenuity, New Ideas Help Increase Steel Capacity

♦ Capacity to meet the customers' ever-increasing demands is steel's most pressing problem . . . Cost estimates for new construction and replacement of existing equipment call for almost \$2 billion per year.

♦ Fortunately, plant ingenuity and new processes offer alternatives for boosting steel capacity . . . The use of superheated, desiliconized wash metal promises to increase present openhearth output by as much as 50 pct.

By P. M. UNTERWEISER, Metallurgical Editor



NEWLY ELECTED AISE president W. H. Collison (left) is congratulated by past president Vohr.

♦ DURING a week in which most of the nation's concern focused on the President's illness, the Association of Iron and Steel Engineers convened in Chicago (September 26-29) to discuss the health and well-being of a basic industry.

From the standpoint of demand for its products, the health of the steel industry is extraordinarily robust. If ever there was an instance of enjoying too much of a good thing, steel's dilemma is a case in point. Right now, the industry's most pressing problem is to somehow create the capacity needed to take care of its customers' ever-increasing demands.

On the subject of capacity, steel's future was pretty well defined by National Steel's chairman, Ernest T. Weir. "Naturally," he said, "we must anticipate in the future, as in the past, periods of low demand and operations. But these will be short range problems. From the standpoint of the longer term, we can see pretty definitely where we are heading—and that is toward further expansion of steel capacity."

Steel's total capacity of almost 126 million tons by the end of 1954 was generally conceded to be more than adequate for the nation's needs until some time in the future. Crossing swords with the Monday morning quarterbacks, Mr. Weir said: "I do not believe anyone realized how short-lived that 'future' would be . . ."

Cost estimates for new construction requirements as well as replacement of existing equipment, approach the phenomenal. Figuring on an average annual increase of 2.5 million tons in capacity, new construction costs might average as much as \$750 million annually. Replacement of equipment may require as much as an additional \$1 billion per year.

Talk turns to alternatives

These figures are staggering, even for an industry used to dealing in the tens of millions. But, fortunately, the installation of new equipment is not the only way steel capacity can be increased. The all-important alternatives were the major theme of the conference. Again and again, they turned up in the technical papers presented, as well as in corridor conversation and official banquet pronouncements.

Perhaps the most provocative alternative of any presented in the technical sessions was that proposed by E. C. Wright, Head, Dept. of Metallurgical Engineering, University of Alabama. Basically, the author suggests the use of superheated, desiliconized wash metal to substantially increase present openhearth furnace output.

Quoting the AISI estimates for 1954, Mr. Wright indicates that the rated capacity of stationary openhearth furnaces in the U. S. was about 94 million tons annually. This figure includes only integrated plants having hot metal available for the openhearth furnaces.

The average melting rate of these furnaces is only about 15 tons of steel per hour. With this

in mind, it is obvious that any method of increasing production in stationary openhearths already built would substantially boost total annual steel production.

The duplex process was certainly a move in the right direction, but it suffered from a major limitation. Only about 10 pct of total steel output can be made by this method. Limitations are the nitrogen content of the fully blown hot metal and the complete dependence of the process on blast furnace metal exclusively. This eliminates the possibility of melting large quantities of steel scrap.

Process offers promise

Professor Wright points out that it would be of great benefit to the operators of stationary furnaces to have a steelmaking process that would melt 30-50 pct cold scrap with partially refined hot metal. The process he suggests seems to provide the answer. It also promises to increase furnace output, decrease slag volume and ore and limestone charges, and produce a low nitrogen steel.

On the basis of test results, hot metal is desiliconized with oxygen before it is charged into the stationary furnace. With a heat containing 4 pct carbon, 1 pct silicon, and 1 pct manganese, less than 60 lb of oxygen per ton of metal is required to reduce the silicon content to below 0.20 pct. At the same time, the oxygen will raise the hot metal temperature to above 2900°F.

The initial temperature of the openhearth furnace is 2750°F. This represents the melting point of an iron-carbon mixture containing about 0.80 pct carbon. It is also representative of the carbon content of a mixture of hot metal and cold scrap at the melt-down point. Scrap must be heated above this temperature before ordinary hot metal at 2450°F, the mixing temperature, can be added to the furnace.

Wash metal at 2950°F can be added to the furnace heat earlier. Because of the higher melt-down temperature, there is an acceleration of the ordinary oxidizing, refining reactions. Partially refined wash metal tends to refine more rapidly. It also adds extra heat to the charge above the critical temperature. This results in a saving of fuel and furnace time.

The estimated increase in production rates claimed for the process border the spectacular. They range from a 25 pct increase with 50 pct wash metal to a 50 pct increase with 70 pct wash metal. Another advantage of the process is that it tends to make the steel plant largely independent of outside scrap sources. It is claimed that home scrap will make up more than 80 pct of the cold scrap needed in the charge mix.

All of the test work required for the development of the process was carried on in induction furnaces. Silica crucibles were used, and oxygen was blown into the bath through a silica

tube. It is claimed that no phosphorus reacted under these conditions. Oxygen consumption per ton of hot metal was 48.3 lb.

Another paper of considerable interest from the standpoint of the economics of steel processing was presented by R. S. Segsworth and M. C. D. Hobbs of Western Canada Steel Co., Vancouver. It dealt principally with a review of potential fields of application for tonnage heating by induction. Actual cost figures were presented for typical installations.

Of particular interest to the steel industry was an analysis of the economic factors determining the use of induction or fuel heating. Assuming that power is available at \$.01 per kw-hr, the authors developed a yardstick for the profitable application of induction heating. "If the cost of fuel, plus scale loss, plus labor, plus maintenance, plus overhead on the fuel fired operation would be \$4 per ton or more, then one would be justified in considering induction heating."

The use of hot extruded solid sections fabricated from carbon steels can result in both conservation of steel and an appreciable reduction in machining costs. The application of the French Ugine-Sejournet process which made the extrusion of solid steel sections economically possible, was the subject of a paper by J. K. Seyler of Jones and Laughlin Steel Corp., Pittsburgh.

Extruded shapes are made by forcing steel billets through a die under hydraulic pressure. The lubricant used in this process is powdered glass. The glass becomes molten at the extruding temperatures and provides lubrication between the die and billet. Extrusion temperatures normally range from 2100° to 2350°F.

Shapes cold drawn for accuracy

When first introduced, this process was applied mainly for the production of high alloy, thin wall tubing. Eventually it was developed to produce solid extruded shapes. A large percentage of hot extruded shapes are later cold drawn in order to provide closer dimensional accuracy.

An indication of how a combination of ingenuity and equipment planning can vastly increase strip mill capacity was gleaned from a paper by F. S. Eckhardt of Bethlehem Steel's Lackawanna plant. Back in 1935, the original Lackawanna mill was built to produce 50,000 net tons per month of hot rolled bands. Of this tonnage, 20,000 net tons per month was to be converted into cold rolled sheets.

During the period 1935 to 1949, two major modernization programs increased hot mill capacity to more than 200,000 net tons per month. Cold mill facilities can now produce about 150,000 net tons per month of cold rolled sheet.

Much of this increase in capacity resulted from increasing slab thickness from a maxi-

mum of 4½ to 7½ in. Unit slab weight increased 91 pct during this same period. Hot rolled coils increased from a maximum of 250 lb/in. of width to about 450.

Finished hot rolled sheets are now made from coils rather than from multiple-cut piler lengths. Most important, the hourly mill tonnage has climbed from 126 to 296 tons per hour.

Important contributions in the field of current control have increased steel production in arc furnaces by as much as 70 pct, according to Republic Steel's L. A. Wynd. Harmful voltage dips are eliminated by transformer design with impedance between the three windings somewhat higher than normal. This results in a 3.25 pct negative value for the equivalent reactance of the high voltage windings, correcting line drop within these limits.

Improve tap changer leads

Automatic optimum current control is used on taps 5, 4, and 3 of the furnace transformers. Taps 2 and 1 are manually controlled by the operator. The use of optimum settings called attention to transformer temperatures. Each arc furnace transformer was equipped with three "hottest-spot indicators."

Other significant electrical improvements include better tap changer leads between transformer terminals and tap changer terminals. Rubber sealed secondaries and pressure relief valves on main tanks and on tap changer compartments further improved installations.

The application of high-speed gas heating methods to medium and heavy sections was discussed by Quentin Bloom of the Selas Corp. of America, Philadelphia. Mr. Bloom indicated that heating rates on larger sections have increased to a point that was once considered both impractical and impossible.

As a typical example of high-speed heating, the paper noted that alloy steel blocks 66 x 24 x 18 in. are now being heated to 1550°F for hardening in about 15 pct of the time previously considered necessary. Uniform quality and a high degree of reproducibility are achieved through automatic control of complete heating cycles.

High-speed heating results in shortening the time required for heating cycles. Thus production is increased and scale losses are appreciably reduced. When similar techniques are applied to the heating of ingot, it is claimed that capital investment has been reduced and steel mill layout simplified.

As is usually the case, the AISE discussions emphasized the practical, rather than the purely theoretical, aspects of steel mill operations. Most of the improvements discussed were of the "down-to-earth" variety which can be readily translated into action. The interchange of this type of valuable information should have a very positive effect in improving the steel industry's capacity picture.

New Stainless Steels Qualify for High-Temperature Service

- ◆ Recent research on stainless steels has been aimed at development of nickel-free grades . . . One such steel—Crucible CMN—has high resistance under stress at high temperatures . . . It also has good oxidation resistance at temperatures up to 2100°F.
- ◆ It is a satisfactory replacement for type 310 in rider sheet applications, and for this purpose it is stronger than type 446 . . . In cast form, its short time tensile strength at 1600° and 1750°F is about twice that of the HH and HK cast grades.

By E. A. LORIA, Staff Metallurgist,
Crucible Steel Co. of America, Pittsburgh, Pa.

◆ **SHORTAGE OF NICKEL** in time of national emergency has presented a serious problem to stainless steel producers as well as consumers. Development work covering the substitution of manganese for part of the nickel in 18-8 stainless steel started during World War II and met with some success. Industry has made certain refinements in this basic composition which has resulted in the acceptance of new stainless steels for substantial applications where Types 301 and 302 have been used.¹

Since it appears that manganese and nitrogen will be more plentiful than nickel, current research is directed to the development of nickel-free austenitic grades, containing appreciable quantities of these elements.

The high C-Cr-Mn-N austenitic steel, designated as Crucible CMN, was first developed for rider sheet, but can be used for a variety of heat-treating furnace parts as well, either in wrought or cast form. Its chemical composition is 0.66 C, 11.88 Mn, 0.68 Si, 24.5 Cr, and 0.39 N.

This steel is free from nickel, possesses a relatively high resistance to deformation under stress at high temperatures and has good resistance to oxidation at temperatures up to about 2100°F. It has much better resistance to stretching under stress at elevated temperatures than type 446 stainless. In addition, it has low content of strategic alloying elements.

The normalizing of auto-body sheet is carried out in a long furnace which has several temperature zones. For example, it provides temperatures of 1725°F at the intake, a maximum of 1900°F at the center and about 1325°F at the discharge end.

The hearth of the furnace consists of a series of rollers. Across the top of the rollers are placed removable rider sheets made of heat-

This is the second article of a two-part series. The first article, which appeared in the Sept. 29 issue of *The Iron Age*, discussed the high-temperature properties of Crucible HNM.

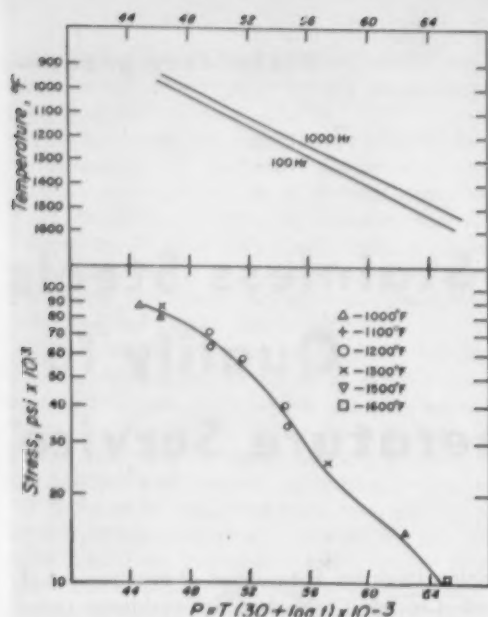


Fig. 1—Master rupture curve for CMN austenitic alloy covers range of 1000° to 1600°F.

resistant steel and the sheets to be normalized are placed upon the rider sheets. Their purpose is to provide a support for the thin sheets being normalized. Also, when used on top and bottom, they protect the auto-body sheet against excessive scaling. Because of their many trips through the furnace, rider sheets are subject to growth, stretching and perforation which limit their service life.

In the past, the most satisfactory rider sheets were made from 25 pct Cr-20 pct Ni steel, generally designated as type 310 stainless. However, because of restrictions on the use of nickel in steels for non-military applications, type 310

Table I

Tensile and Stress Rupture Properties of Cast CMN

Material	Test Temp., °F	Tensile Strength, psi	0.2 pct Yield Strength, psi	Elongation, pct	Reduction of Area, pct	100 Hour Stress,* psi
CMN	1600	38,000	27,900	8	16	10,000
	1750	26,000		32	42	
HH	1600	23,500	18,000	23	40	6,000
	1750	17,000		35	67	
HK	1600	18,600	14,500	62	66	9,900
	1750	11,500		49	86	

* Stress to produce rupture in 100 hours

	C	Mn	Si	Cr	Ni	N
CMN	0.69	11.93	0.57	24.95		0.50
HH	0.30	1.33	1.46	26.20	13.46	0.08
HK	0.51	0.78	1.16	24.20	19.40	

may not be available for rider sheets. Plain 25-pct Cr steel, known as type 446 stainless, has been used as a substitute.

Because type 446 has a structure consisting primarily of ferrite and carbides, in contrast to the structure of austenite and carbides in type 310, rider sheets made from type 446 are much weaker than those made from type 310. It is generally known that austenite is much stronger than ferrite at temperatures above about 1200°F.

Not only the rider sheet application but also the application of CMN in heat-resistant castings indicates its general usefulness as a high-temperature alloy. In a study of the cast properties of this steel with such standard cast grades as HH (26 pct Cr-12 pct Ni) and HK (26 pct Cr-20 pct Ni), CMN has better stress rupture strength at 1600°F up to 225 hours compared to HH and up to 120 hours compared to HK.

By means of the parameter method, the stress

Table II

Stress Rupture Properties of CMN Sheet

Test Temp., °F	Crucible CMN		Type 316	
	100-Hour Life, psi	1000-Hour Life, psi	100-Hour Life, psi	1000-Hour Life, psi
1000	80,000	74,000	64,500	47,500
1100	65,000	55,000	44,000	37,000
12,000	45,000	35,000	32,500	25,000
1350	29,000	18,000	17,000	12,500
1500	13,000	10,000		

Condition of CMN: 2150° F for 6 minutes, air cooled;
1500° F for 16 hours, air cooled.
Furnace temperature, 35 Rf

Table III

Stress Rupture Properties of Welded CMN

Filler Metal	Stress, psi	Rupture Life, hr	Elongation, pct	Reduction of Area, pct	Base Metal Rupture Life, hr
CMN Strip	55,000	16	10	13	7
	45,000	166	7	8	139
WH Rod	55,000	13	10	6	
	45,000	141	6	9	

Condition: Solution treated at 2150° F before welding, stabilized at 1500° F, 16 hr, air cooled.
WH Rod: 0.80 C, 19.0 Cr, 9.0 Ni, 4.9 Mn, coated electrode.

rupture strength of cast CMN at 1600°F was found to be equivalent to a stress of 38,000 psi for 1000-hour rupture life at 1200°F. Since this value is higher than the average value obtained for available low alloy stainless sheet, it was desirable to obtain the high-temperature strength data for the 0.060 in. thick sheet.

The short time tensile strength of cast CMN at 1600° and 1750°F is about twice that of the HH and HK alloys, as given in the data in Table I. The as-cast hardness of CMN is 33 Rc compared to 83 to 86 Rb for the HH and HK designations of the Alloy Castings Institute.

It appears that the relatively high hardness of CMN controls the strength in the short time test, but the cause of this hardness and strength loses its effectiveness after long exposure at 1600°F. At present, the high hardness of the as-cast, or as-rolled, CMN cannot be explained. Rider sheet 36 x 96 x 0.037 in. thick with an annealed hardness of 25 to 30 Rc (2000°F for 4 minutes) is now being produced commercially.

The effect of solution treatment time and stabilization temperature on the stress rupture strength was determined by stress rupture tests on the 0.060 in. thick sheets following different heat treatments. These results revealed that the strength increased with increasing stabilization temperature and decreased with the longer time at the solution treatment temperature.

Hardness varies slightly

Maximum strength and rupture ductility were obtained by heat treatment at 2150°F for 5 minutes, air cooling, then bringing the sheet to 1500°F for 16 hours and air cooling. Neither the duration of solution treatment nor the stabilization temperature had any significant effect on the room temperature hardness which varied only from 32 to 34 Rc.

A master rupture curve shown in Fig. 1 was obtained for the CMN austenitic sheet alloy covering the 1000° to 1600°F temperature range. Values for the 100-hour life and the

1000-hour life at several temperatures are given in Table II. From 1000° to 1200°F, these values greatly exceed the requirements of one large engine builder for low alloy sheet which have been set at 74,000, 44,000 and 25,000 psi in the specified temperature range.

The values for CMN exceed those normally obtained for N-155 and Chromoloy. A direct comparison with 17-7 PH, at the maximum temperature of 900°F for which values could be obtained, reveals a 1000-hour rupture strength of 57,000 psi for 17-7 PH, hardened to its maximum strength as opposed to 74,000 psi for 1000-hour life at 1000°F for CMN.

Stress rupture tests at 1200°F were made on samples of CMN steel as welded with the same composition as the filler metal and with WH rod as filler metal. When compared with the stress rupture values obtained on the unwelded steel, the results in Table III indicate that welding with these filler metals does not impair the stress rupture strength of the high C-Mn-Cr-N austenitic steel. The overlay was not removed before the tests were carried out.

The short time tensile properties of the unwelded sheet at 1200° and 1500°F are given in Table IV. CMN has better strength than that obtained for type 316 at both temperatures. Its properties can also be compared with those obtained from 0.060 in. thick sheets of stainless W, Inconel-X and 4340.² Of these alloys, only the more expensive Inconel-X has superior properties in comparison to CMN steel. Heating the steel at 2150°F to put it in the most stable austenitic condition, and then air-cooling, produces a hardness from 31 to 38 Rc.

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- ¹AISI Report, New Stainless Steels Containing Chromium-Nickel-Manganese, Contribution No. 47, May 1955.
- ²P. J. Hughes, J. E. Inge and S. B. Prosser, Tensile and Compressive Stress-Strain Properties on Some High Strength Sheet Alloys at Elevated Temperatures, NACA, TN 3315, Aug. 1954.

Table IV

Elevated Temperature Properties of CMN

Material	Test Temp., °F	Tensile, psi	Elongation, pct
CMN	1200	76,000	10
	1500	46,000	22
Type 316	1200	66,000	40
	1500	27,000	50
Stainless W	1600	77,700	50
Inconel-X	1800	110,350	32
4340	600	170,000	14
	800	134,500	
	1000	74,650	

All materials 0.060 in. thick. Condition of CMN: 2150° F for 5 minutes, air cooled; 1500° F for 16 hr, air cooled.
Annealed CMN room-temperature properties: 156-166,000 psi tensile, 93-96,000 psi yield (0.2 pct), 17-22 pct elongation, 33-36 Rc hardness.

Save other machines—

Turret Lathes Adapt Easily to Special Machining Jobs

♦ Modern turret lathes are adaptable to many ingenious setups . . . For small shops, this means ability to handle a multiplicity of jobs with a minimum of equipment.

♦ In larger shops, turret equipment can often mean savings in floor space, in labor and handling requirements, in tooling costs . . . International Harvester's Tractor Works tooled three such lathes to handle an entire sequence of operations.

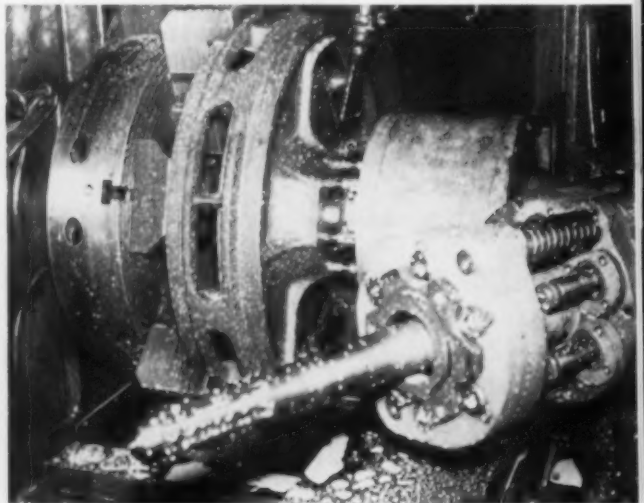
By D. L. HANSEN,
Mechanical Engineer,
Tractor Works,
International Harvester Co., Chicago

♦ MACHINE SHOPS, particularly smaller shops, cannot always justify the purchase of elaborate machine tools. Instead, they have found the versatile turret lathe adaptable to a surprising number of special setups. Even in larger, more fully equipped shops, tooling up with such general-purpose tools for special work can often result in substantial savings.

A good case in point is a recent application at International Harvester's Tractor Works, Chicago. Crawler type tractors produced here require front idler wheels. These are made from 32-in. diam, 300-lb steel castings. Each such casting must be bored and hub ends must be faced. Then six holes in a bolt circle have to be drilled and tapped in each end of the hub.

What might be termed "normal" tooling for this sequence of operations would be three turret lathes, to handle operations on both sides, plus a multiple-spindle drill and a radial drill for tapping, the last two requiring turn-over fixtures. Handling equipment between these machines, and additional operators for each of the two drills, would also be required.

To hold equipment and tooling costs to a minimum, as well as to save labor and minimize space required for manufacturing, three Potter & Johnson turret lathes are used for the entire job. This means providing each lathe with two special six-spindle heads to do drilling and hole tapping, respectively, plus some means for driving the heads since they could not be driven from the supporting turrets. Such heads are moderate in cost, however, and as the hub of each casting has a through hole, arrangements for driving the heads from the spindle could be made readily.



CAST STEEL tractor idler, drilled by the six-spindle head in foreground, is now tapped.

With such a setup, the two extra drilling machines were not needed and the expense of providing them with turnover fixtures was eliminated. This saves \$2000 on tooling alone, as well as the cost of providing two extra machines and extra handling equipment. Labor charges also are nearly halved.

Tooling on this machine has another unusual feature besides the use of the multiple spindle heads—a hinged boring bar. The bar makes it possible to machine two identical bore diameters in each end of the hub simultaneously. Each such diameter is $1\frac{1}{4}$ in. long and the two are separated by a cored recess. Use of this bar has reduced rough and semi-finish boring cycle time considerably.

Sequence worked out

Procedure is as follows: After chucking the work, the cored central hole is first rough-bored at both ends and one end is rough-faced in a plunge cut. Then the tool in the second turret position semi-finish-bores both ends, and tools in the third position finish-face the outer hub end and chamfer sharp edges. Next the bore is reamed at both ends, the tool traversing rapidly between these two cuts while passing the cored cavity.

At the next turret index, a six-spindle U. S. drilling head comes into working position. At its center is a drive shaft having a splined end. As the head is fed in, with the workpiece turning at slow speed, the head spline engages a mating spline in the lathe spindle, and the six sub-land drills then are rotated on their own axes while the head as a whole turns with the work. Then the head is fed inward and the six

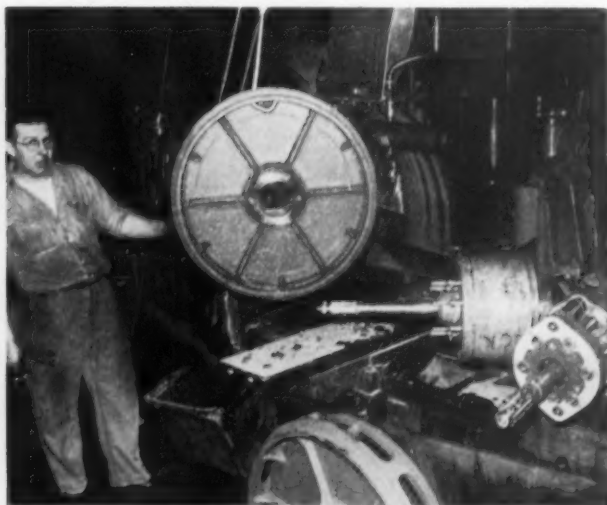
holes are drilled and chamfered, ready for tapping.

After the drill head retracts and the turret indexes, another U. S. head carrying six $\frac{1}{2}$ -in. No. 20 taps, and having a similar splined extension, is indexed into position and the driving spline is engaged. Then the head advances, turning with the work, while taps revolve around their own axes at tapping speed. This results in all holes being tapped to 5/16-in. depth. After reaching this depth, taps thread themselves into the workpiece for a distance of $\frac{3}{4}$ in. during machine dwell.

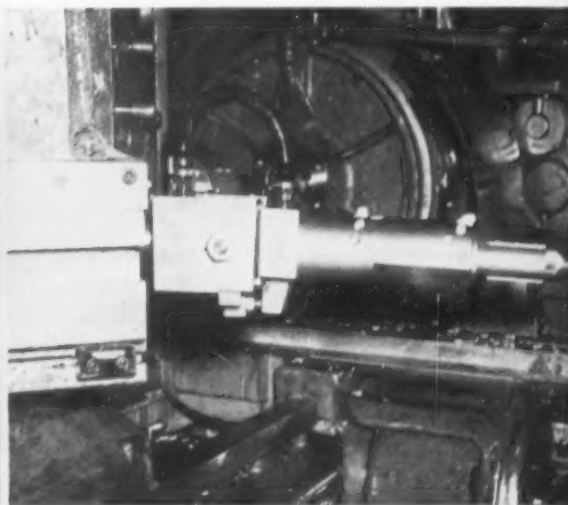
Tapping head spindles have individual reversing mechanisms. Floor-to-floor time on this machine is 14.47 minutes. Production requirements are such that two duplicate setups are needed. Work from both these lathes feeds to a third lathe, of the same size and make, that faces, drills and taps the second face, the bore having been finished in the first operation. This third lathe, having no boring or reaming to do, can complete its cycle in half the time necessary for the two lathes machining the first side of the castings.

All three lathes run through their cycles automatically, except for loading and unloading, which is facilitated by the use of a trolley hoist. Hence, only one man is required to handle the entire job. He loads and unloads the first two lathes, shifts castings to the third lathe and unloads it as well. The job would require three men if the two separate drilling machines were used.

Actual labor charge per piece with the setup is about half what it would be using the two separate drilling machines.



MULTIPLE-SPINDLE heads are driven by splined shafts which engage the lathe spindle.



SPECIAL hinged boring bar shortens rough and semi-finish boring cycles substantially.

One man operation—

Changed Machining Setup Boosts Output

♦ A SINGLE OPERATOR attends both an 8-spindle vertical turret lathe and an automatic lathe for fast machining of cast steel parts at Clark Equipment Co.'s Jackson, Mich., plant. This machining setup handles all the necessary turning, boring and facing operations on large spider castings used in the planet carriers of the firm's front loading equipment products. Present production rate on these workpieces is 17 to 20 times faster than that formerly achieved by two turret lathes, also tended by a single operator.

On the 16-in., 8-spindle Bullard Mult-Au-Matic, the first station is used to chuck the casting on a hole through its lower flange. Proper machining height is set by the adjustable studs on which the flange rests.

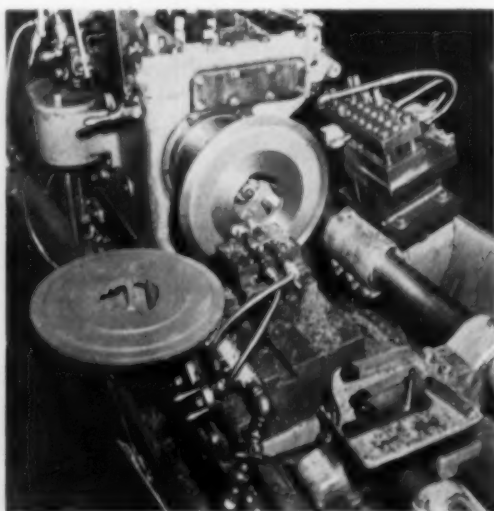
Tooling at stations 2 through 8 handles most

of the flange facing and chamfering operations, and also roughs and finishes the hole in the smaller of the spider's two flanges. Most tools on this machine use Kennametal tips of the throwaway type. These provide either six or eight cutting edges and help effectively in reducing machining costs. All tips have a 6° negative top rake.

As castings are completed on the vertical lathe, they are transferred to a 20-in. Fay automatic. Here a chamfer is cut at the inner edge of the large flange hole; the flange itself is also faced to proper thickness and its outer diameter is chamfered. Because this lathe operates without attention after the workpiece is chucked in position, the operator has ample time to attend the vertical machine as well. Machining cost per piece has been cut drastically.



VERTICAL turret lathe does bulk of fast machining on flanges of these cast steel parts.



AUTOMATIC lathe handles facing and chamfering operations on rear face of the large flange.

Point of Honor



From the collection of Lewis Winant, New Jersey Arms Collectors Club. Maker: Johann Kuchenreuter, Regensburg, Germany, 1740-1757. An 11-by-14 inch print of this illustration with bearings and lettering omitted is available on request on company letterhead.

In today's business dealings (as in yesterday's "affairs of honor") both parties are protected by an intangible factor known as **INTEGRITY**—a figurative handsake between producer and consumer. Today, this point of honor assures you that the product you buy is exactly as represented. When you write **COMPO** Oil-Retaining Porous Bronze Bearings into your specifications you find that it is a point of honor with Bound Brook, as a reliable manufacturer, to provide you with the best powder metallurgy bearings that can be produced.

11

BOUND BROOK

BOUND BROOK OIL-LESS BEARING CO., EST. 1883, BOUND BROOK, N. J.

Pioneer in

POWDER METALLURGY BEARINGS + PARTS

METAL STAMPING FACILITIES

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at your Service for...

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NATION'S LARGEST
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FREE AIDS

New Technical Literature:

The crane in automation

A new booklet, "Planning the Crane for its Use in Automation," answers many questions executives ask about the place of overhead materials handling. It is adapted from a talk delivered before the Houston Chapter of the American Materials Handling Society, and gives basic information helpful in adapting cranes to automation in many plant departments. Some sections of the booklet are: Fundamentals of good plant operation, top running overhead cranes, gantry cranes, underslung cranes, crane interlocks, automatic handling applications of cranes. *Whiting Corp.*

For free copy circle No. 1 on postcard, p. 121.

Loading problems

Solutions to 13 difficult dock loading and yard loading problems are outlined in a new 4-page folder. A line drawing illustrates each problem given, and actual photos show how the problem was solved by a Magcoa magnesium Dock-board or Yard Ramp. *Magnesium Co. of America, Materials Handling Div.*

For free copy circle No. 2 on postcard, p. 121.

Wax lubricants

Functions and advantages of wax as a lubricant in the metal forming operation is explained in a new booklet. It describes the physical function of wax during the drawing operation and tells how wax provides vital lubrication especially under extreme pressures and high temperature. The booklet describes how industrial waxes can withstand pressures as high as 200,000 psi and temperatures in excess of 450°. Case histories telling of economies realized through reduction of scrap, elimination of drawing steps, increases in die life and reductions in downtime are included. *S. C. Johnson & Son, Industrial Products Dept.*

For free copy circle No. 3 on postcard, p. 121.

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 121.

Grinding machines

An all new catalog introducing two new antifriction super-accurate centers as well as the line of solid centers for grinding machines has just been issued. A unique page arrangement provides data relative to the high speed and carbide tipped solid centers. It catalogues this material for easy selection and location and shows prices and specifications for both full and half solid centers. *Ready Tool Co.*

For free copy circle No. 4 on postcard, p. 121.

Industrial fans

Fans for commercial and industrial ventilation are described in a new illustrated 4-page catalog. Features of the V-belt driven fans and their applications are discussed, and tables of performance data are included. One of the two lines of fans covered is for commercial and light duty industrial exhaust installations, the other, for heavy duty industrial applications. *American Blower Corp.*

For free copy circle No. 5 on postcard, p. 121.

Oil filters

"Filter Research, How and Why" tells the story behind the development of effective oil filters. The 8-page booklet starts at the Caterpillar test stands, carries through testing of engines in the laboratory and the field to the final design. Booklet is also available in French, Spanish and Portuguese. *Caterpillar Tractor Co.*

For free copy circle No. 6 on postcard, p. 121.

FREE TECHNICAL LITERATURE

Waste disposal

The first fully-automatic waste disposal system in the automobile industry for destroying cyanide and neutralizing acid-alkali waste is one of the items covered in a group of article reprints and bulletins offered. Another reprint offers helpful hints for cutting electroplating costs with proper waste disposal. *Frederick B. Stevens, Inc.*

For free copy circle No. 7 on postcard, p. 121.

Friction materials

Methods used to insure long life of friction materials in Caterpillar-built machines is explained in a new 8-page booklet titled "Friction Facts." In question-and-answer form, the publication discusses the company's testing and research program for obtaining proper qualities in clutch facings and brake linings, and shows some of the tests set up to simulate typically rugged field conditions. *Caterpillar Tractor Co.*

For free copy circle No. 8 on postcard, p. 121.

Needle rollers

A 12-page illustrated engineering catalog on precision needle rollers includes data on rollers never before published. Data is based on the application of the rollers in automobile and truck transmissions, universal joints, clutches and steering gears and in practically all types of machinery. Information on spherical, conical and flat-end types of needle rollers available from stock is given, together with sizes, specifications and application information. *Kaydon Engineering Corp.*

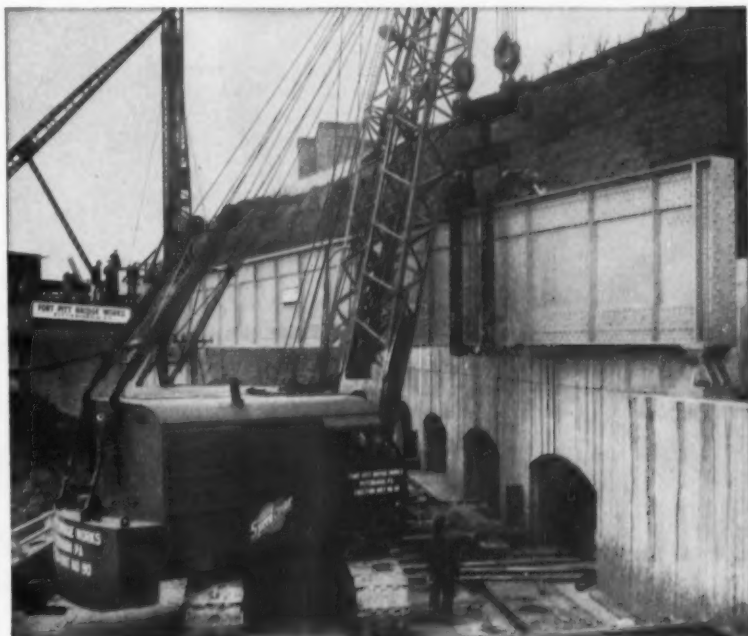
For free copy circle No. 9 on postcard, p. 121.

Spring design data

Basic considerations in the design of precision springs are discussed and illustrated in a selection of engineering data sheets now offered. Subjects included are spring index, coil diameter variation, modulus and physical properties of spring materials, tolerances and a comparison of physical properties of spring materials. Pages are designed for loose leaf filing. *Hunter Spring Co.*

For free copy circle No. 10 on postcard, p. 121.

ERECTING AN 83-Ton Girder for a new B & O Railroad Bridge...



...just an everyday job for FORT PITT BRIDGE

Exceptional engineering and better than half a century of experience are yours when the structural steel work is awarded to FORT PITT BRIDGE. Count on the complete job, well done—including engineering, fabrication and erection.

Call on FORT PITT BRIDGE for highway and railroad bridges, steel mill buildings and extensions, modern buildings of all types.

Steel Permits
Streamlining
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with Safety,
Endurance and
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CHIPPERS get longer, more comfortable protection



Rigid metal top bar holds sturdy nylon cups firmly—makes goggles much easier to handle, too!

Kover-Mor® Goggles designed for chippers are fitted with Willson *Super-Tough* lenses heat treated for greater impact resistance. Note how 4 screened eye cup ports admit air to keep lenses fog-free.



WILLSON Kover-Mor® Goggles are roomy ...fit over large-frame prescription glasses

Kover-Mor® Chipper's Goggles are made of lightweight nylon with the highest *strength/weight ratio* known for goggle cups. Chippers say they have features that make them the most comfortable goggles of all.

Snug, easy fit is assured by adjustable two-piece headband, leather bridge curtain and metal top bar. Extra ventilation is provided by

slots in screw caps *plus* ports in cups.

Standard 50 mm. round lenses fit Kover-Mor® Goggles. No need to stock odd-size replacement lenses! Lens changing is simplified by external screw caps.

Ask your Willson distributor for Kover-Mor® Chipper's Goggles—available with opaque or clear nylon cups. They'll withstand toughest use.

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WILLSON PRODUCTS, INC., 231 WASHINGTON ST., READING, PA.

FREE TECHNICAL LITERATURE

Handling equipment

Features of the HydraFork Truck, an electric fork truck equipped with hydraulically operated forks which extend to pick up, retract and then deposit the load, are described in the fall issue of the *Lever*. The 16-page publication also describes some applications of other hand and power equipment produced by the company. *Lewis-Shepard Products, Inc.*

For free copy circle No. 11 on postcard, p. 121.

Mullite refractories

A new 24-page catalog is available describing "Shamva" mullite brick and special shape refractories. The catalog contains many illustrations of typical installations, as well as performance data, specifications and properties of the six types of "Shamva" mullite, their applications, standard shapes and sizes available, and special properties. *The Mullite Refractories Co.*

For free copy circle No. 12 on postcard, p. 121.

Vinyl-coated steel

A brochure describes how patterns and colors embossed into mild steel, stainless steel or aluminum remain unaffected by any of the standard fabrication techniques, including deep drawing, and describes how the patterned, vinyl-coated metals may be used to stimulate product sales, improve design and lower production costs. Selling power of a variety of suggested colors is demonstrated in a number of embossed patterns. *Sun Steel Co.*

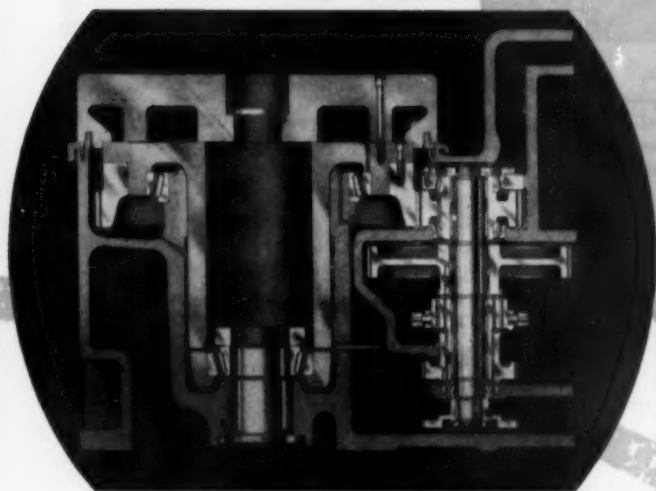
For free copy circle No. 13 on postcard, p. 121.

Polyethylene facts

An 8-page illustrated booklet, "Plastics for Chemical Engineering Construction — Polyethylene," is now available. The booklet details the molecular structure, and discusses its properties. Typical applications to industrial uses are illustrated. Tables indicate the properties of structural polyethylene from tensile strength and elongation to water absorption and chemical resistance particularly to corrosive environments. A chart presents weights per foot of seamless centrifugally cast tubing based on inner and outer diam. *American Agile Corp.*

For free copy circle No. 14 on postcard, p. 121.

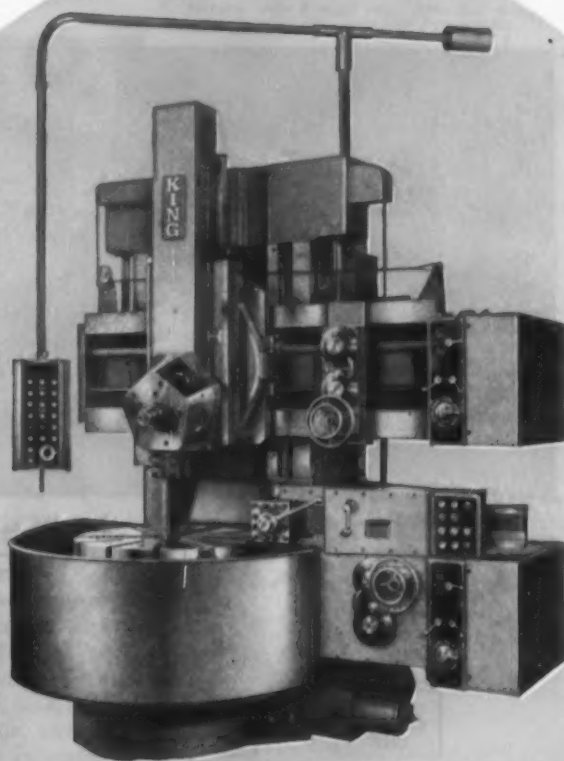
New features
of the
advanced design
KING
assure
greatly increased
accuracy



**IMPROVED SPINDLE CONSTRUCTION
PROVIDES MAXIMUM TABLE STABILITY**

Among the many improvements incorporated in new King® Vertical Boring & Turning Machines is the construction and mounting of the spindle. As shown above, the spindle itself is extra-heavy and rigid. Tapered roller, pre-loaded bearings are placed to provide extreme stability and accuracy of operation. Bearing adjustment as well as spindle assembly removal are quickly accomplished. Helical gear spindle drive completely eliminates any tendency toward spindle deflection. Lubrication is automatic and safety-interlocked.

With many other features—see listing at right—the completely redesigned KING will bring to boring mill users the greatest productive capacity ever achieved for vertical boring and turning work. For full details, send for new Catalog K-5 covering 30", 36" and 46" sizes. (Catalogs on larger sizes will be available later.) Write to us direct or to the King distributor in your area.



36" KING with Turret Head,
Side Head, and Coolant Pan. Wide variety of
head combinations available.

**MAJOR STANDARD FEATURES
OF THE ALL NEW KING**

INCREASED HORSEPOWER:

40 to 50 H.P. on 30" to 46" sizes.
75 to 100 H.P. on sizes 56" and up.

EXPANDED FEED AND SPEED RANGE:

24 feeds and 24 speeds available.

**COMPLETE ELECTRICAL CONTROLS,
CONVENIENTLY LOCATED:**

Pendant-Located Control of:

- Pre-selective speed selection from direct-reading dial. • Speed change.
- Feed and rapid traverse movements of all heads.
- Power swiveling of rail heads.
- Turret Index. • Table stop.

Fixed Panel Side-Head Mounted Control of:

- Main drive motor. • Rail positioning.
- Thread cutting and taper turning selection for all heads.
- Coolant pump.

DIRECT-READING FEED SELECTION DIAL.

**AUTOMATIC LUBRICATION OF ALL
MOVING PARTS.**

**ANTI-BACKLASH NUTS FOR ALL
CROSS-FEED MOVEMENTS.**

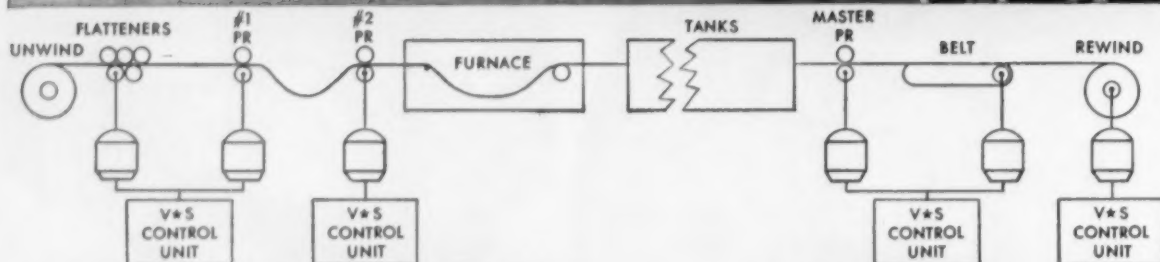
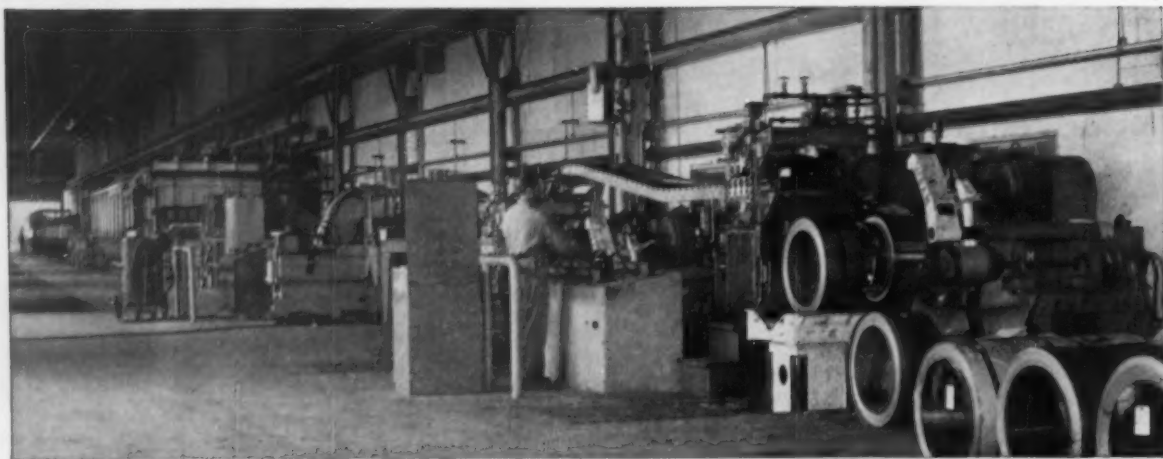
**J.I.C. AND NMTRA APPROVED ELECTRICAL
CONTROL SYSTEM.**

**MACHINE ADAPTED FOR SIMPLE OPTIONAL
ADDITION OF:**

- Automatic positioning of heads.
- Automatic tracing control of heads.
- Automatic cycling. • Power rail clamping.
- Power indexing of turrets.

AMERICAN STEEL FOUNDRIES, KING MACHINE TOOL DIVISION
1150 Tennessee Ave., Cincinnati 29, Ohio

KING Vertical Boring and Turning Machines



Pickling Line V*S Drive Control Units



PACKAGED DRIVES KEEP STAINLESS ON THE MOVE

As much as 14 miles of stainless steel strip is processed each day on the Atlas Steels, Ltd. two-strand pickling line . . . Canada's first continuous stainless steel pickling line.

Because this is a large stainless line requiring special care to prevent surface marring or scratching, consideration had to be given to the drive system. The drive requirements were for precisely controlled tension over wide speed ranges with extremely reliable control. Reliance V*S Drives with built-in electronic regulators keep the line moving and afford the flexibility to permit line speeds from 5 to 50 feet per minute for strip .007 to .187 inches thick and 10 to 20 inches wide.

Four compact V*S Control Units which house the fac-

tory-wired motor-generator sets and the control panels supply power to the motors for each half of the twin line. The "packaged" feature of the drive means extreme ease of installation and a great saving in installation cost plus the ability to tailor the drive system to the actual requirements. This "tailoring" meant that wide constant-horsepower speed range motors could be used to fit in with the line speed variables. These variables were created by the need for running strip of varying thicknesses and widths through the line at speeds dictated by the annealing furnace "constant tons per hour" limits.

This is a good example of the ability of Reliance to tailor drive systems to the specific application requirements of the steel industry. Write for Bulletin A-1555. D-1602

RELIANCE ELECTRIC AND ENGINEERING CO.

Cleveland 10, Ohio • Offices in Principal Cities

Canadian Division: Welland, Ontario

Builders of the Tools of Automation

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 116

Stainless tubing

Stainless steel tubing, nickel and nickel alloy tubing, and small tubular specialties are described in an 8-page catalog. The literature outlines engineering services available, shows many typical applications, and gives data on the various forms of the products available. Comparisons of properties and a listing of standard sizes are given. *J. Bishop & Co. Platinum Works, Stainless Steel Products Div.*

For free copy circle No. 15 on postcard.

Rubber engineering data

A Rubber Engineering Data Book discusses the company's line of molded and extruded rubber products. Technical specifications and relative properties of natural rubber, Buna S, Buna N, neoprene, butyl, thickil and silicone are included in a special section. Some of the industrial uses of the company's wide range of custom-built seals, boots, gaskets, rolls, covers, sleeves, shields and shock mounts are described. *Tyer Rubber Co., Industrial Products Div.*

For free copy circle No. 16 on postcard.

Forging hammers

Catalog No. 155 contains information on forging hammers. Four types of hammers are covered: cushioned helve, upright helve, upright strap and compact hammers. Specifications on the hammers and an interesting history on the art of hot and cold forging from early civilization to the present are included. *C. C. Bradley & Son.*

For free copy circle No. 17 on postcard.

Electric motors

Electric motors, fractional and integral, from one-sixth to 5 hp are described in an 8-page catalog. Besides discussing basic motor types, the catalog includes an electric data and motor applications chart. Other charts give condensed mounting and mechanical data, mounting dimensions, basic mechanical variations and shaft extension dimensions. *The Leland Electric Co.*

For free copy circle No. 18 on postcard.

Notching units

A comprehensive catalog describes the company's self-contained notching units for interchangeable use and reuse in unlimited setups in stamping presses and press brakes. Type N units for notching mild steel up to 1/8 in. thick and Type NJ units for steel to 1/4 in. thick are covered, and the booklet describes how each unit is independently mounted to provide quick setups according to varying patterns. *Wales-Strippit Corp.*

For free copy circle No. 19 on postcard.

Continuous heat-treating

Complete details on completely automatic continuous heat-treating installations with production capacities from 100 to 800-lb per hour are offered in Catalog 850.10. The literature shows how the wide range of sizes available permits the small plant or the individual production line to utilize a continuous automatic installation for heat-treating, quenching, washing and tempering. *American Gas Furnace Co.*

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FREE TECHNICAL LITERATURE

Hobbing machine

Information is offered on an alternate design for the No. 1 Small Gear Precision Hobbing Machine, which adapts the machine to any tooling regardless of style or make of hobbing machine for which the tooling was constructed. *The Hamilton Tool Co.*

For free copy circle No. 21 on postcard.

Shell core machine

A 4-page folder describes and illustrates features of the Chicopee Core Chief shell core blower. Some typical work turned out with the machine is shown and specifications are included. *Shell Process Inc.*

For free copy circle No. 22 on postcard.

Three-dimensional cams

The evolution of three-dimensional cams from theory to working finished product is described in a 4-page bulletin. The three-dimensional cam is compared with the two-dimensional cam and illustrations and working drawings show the large number of stations possible with the three-dimensional cams. *Parker Stamp Works, Inc., Cam Div.*

For free copy circle No. 23 on postcard.

Milling machine

A 4-page bulletin tells how the Quartet mills four ways on one machine, and shows how, in one setup and without the use of fixtures, milling, drilling and boring operations may be performed to extremely close tolerances. Complete specifications are included. *The U. S. Burke Machine Tool Div.*

For free copy circle No. 24 on postcard.

Materials handling

A new bulletin "Move Materials" is set-up for quick, easy reading and as a ready reference. There are photo cuts with thumb-nail descriptions of some of the exclusive cost reducing features of the stand-up and sit-down models, tables of complete specifications of each model and a page of sketches showing 12 Mobilift matched attachments. *Lamson Mobilift Corp.*

For free copy circle No. 25 on postcard.

FOR MORE LITERATURE

Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers.

Temperature measurement

"How Temperatures Are Measured," an 8-page booklet, covers such topics as heat and temperature as separate concepts; history of the commonly-used temperature scales; physical effects associated with a rise in temperature, and how thermometers and pyrometers utilize some of these effects; and the monitoring of surface temperature by means of changes in color or physical state. *Tempil Corp.*

For free copy circle No. 26 on postcard.

Vacuum pumps

"The Story of the Ring Jet Pump," an 8-page booklet, tells how and why the company developed its line of diffusion and booster pumps to fill the need for faster pumping in the pressure range where most high-vacuum processing is now being done. The Ring-Jet design feature which permits the pumps to operate at speeds from 10 pct to as much as 100 pct faster than conventional diffusion and booster pumps of the same sizes and heat inputs is described. *F. J. Stokes Machine Co.*

For free copy circle No. 27 on postcard.

Milling equipment

A set of looseleaf bulletins describing the new 2XH Milling Machine, universal toolmakers over-arm, universal milling attachment, rack milling attachment, heavy duty vertical milling attachment, plain and universal dividing heads, clutch control, slotting attachment and other products are offered. *Greaves Machine Tool Div., J. A. Fay & Egan Co.*

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Contact **KAYDON** Muskegon

FOR ALL TYPES OF BALL AND ROLLER BEARINGS: 4" BORE TO 120" OUTSIDE DIAMETER



KAYDON single row, tapered roller bearings 12.125" x 13.250" x .718"
Total bearing weight: 3.15 lbs.

KAYDON creates world's THINNEST tapered roller bearings — REALI-SLIM as a wedding ring

Here's another first by KAYDON of Muskegon. We now offer the *thinnest* single row, tapered roller bearings ever made. Even a bride's modern wedding ring, made to proportionate size, would not be as thin or light in weight as one of these *Reali-Slim* bearings.

If you're faced with bearing problems, which involve conserving space and weight, consult KAYDON while your product design still is on the drawing board. Remember — for standard bearings or bearings of unusual design you can depend on KAYDON for the engineering skill and manufacturing facilities to do your job. It pays to contact KAYDON first!

Write for engineering catalog!

For complete data on capacity, seals, separators, standard and *Reali-Slim* "wedding ring" bearings, ask for catalog No. 54.



KAYDON

THE

KAYDON types of Standard and Special Bearings:
Spherical Roller • Taper Roller • Ball Radial • Ball Thrust
• Roller Radial • Roller Thrust • Bi-Angular Bearings

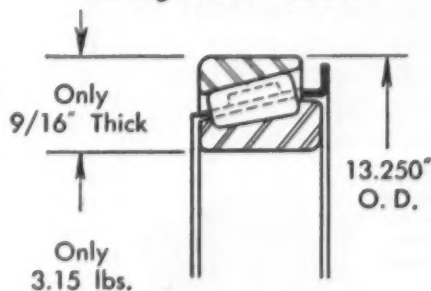
ENGINEERING CORP.

MUSKEGON • MICHIGAN

K-551

PRECISION BALL AND ROLLER BEARINGS

Details of thin section, lightweight bearing shown above





NIAGARA
Aero HEAT EXCHANGER

WATER SAVING

with

TROUBLE-FREE COOLING EQUIPMENT

● Cools your jacket water for engines or process equipment or electric apparatus. Your closed system keeps free from dirt or maintenance troubles. You can cool air, gases, chemicals, plating baths, quench baths, welding machines, extrusion and drawing machines and hydraulic presses. You get real precise temperatures, save rejections, lower production costs. Use NIAGARA AERO HEAT EXCHANGER cooling with atmospheric air... saves water, pumping, piping and power; quickly saves its costs.

Write for
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and 124

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Units Up To
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BTU Capacity



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in Principal Cities of U. S. and Canada

TECHNICAL BRIEFS

CHEMICALS: Better Recovery

System salvages zinc plating solution
dragout, solves waste disposal problem . . .
Double evaporation halves steam needs.

Recovery of zinc plating solution by evaporation of rinse water, utilizing a method and equipment new in plating operations, has solved a stream pollution problem in the disposal of cyanides in waste material.

The method is being used by Channel Master Corp.'s, Ellenville, N. Y., plant, where some of the company's products and job lots of metal products of other manufacturers are being electroplated with zinc.

Double-effect evaporator

Equipment used to recover plating solution and supply distilled rinse water is a double-effect evaporator supplied by the Buffalo Equipment Div. of Blaw-Knox Co. Rated capacity of this evaporator is 750 lb. of water per hour when supplied with 100 gallons of rinse water per hour containing 1.85 pct solids.

The recovery equipment operates at temperatures low enough to prevent conversion of the cyanides to carbonates. Maximum temperature of 180°F is maintained by vacuum in the first effect and a still lower temperature and higher vacuum in the second effect. Use of double-effect evaporation reduces steam requirements to half those of single effect evaporation.

Economical Recovery

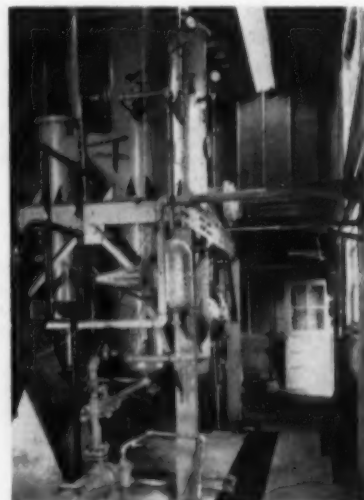
Operating experience to date indicates a steam consumption of 90 lb. of 15-psi. steam per pound of sodium cyanide recovered. An ejector unit used with the evaporator requires an additional 50 lb. at 90-100 psi. About 500 gallons of cooling water at 60 de-

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 121. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

grees F are required for each pound of sodium cyanide recovered. With steam at \$1 per 1000 lb. and cooling water at 7 cents per 1000 gallons, these costs add up to 18 cents per pound of sodium cyanide recovered. These figures cover the recovery of zinc cyanide and sodium hydroxide also. Total labor required is less than one man-hour per 8-hour shift.

The system recovers the dragout from about 11,000 gallons of zinc plating solution in the plating tanks and has a maximum capacity of 160 lb of sodium cyanide per day.



Double-effect evaporator..

TECHNICAL BRIEFS

Cleaning:

Shot blasting cuts costs 25 pct.

Modern shot blasting facilities have cut rust and scale removal costs 25% at Montreal Locomotive Works, Ltd., within the first month of operation. They also have eliminated the possibility of silicosis and speeded production.

The outdoor sand blasting operation used before was in operation for almost 50 years before



Better cleaning . . .

its replacement. It required two men to operate, with only one actually sand blasting. Other disadvantages included the danger of silicosis, the need to heat and dry sand in coke-fired hoppers before use, inability to operate in wet weather or extreme cold and lack of accessibility from manufacturing shops. Replacement was made in August.

Extendible Room


The new shot blast room is 20'x20'x60' with an extension of 20' for longer pieces such as refinery towers and columns. Shot is released under 100 psi pressure and is recovered by a sub-floor conveyor system for reuse and continuous operation.

Two men can blast at once. Hoods are worn for protection.

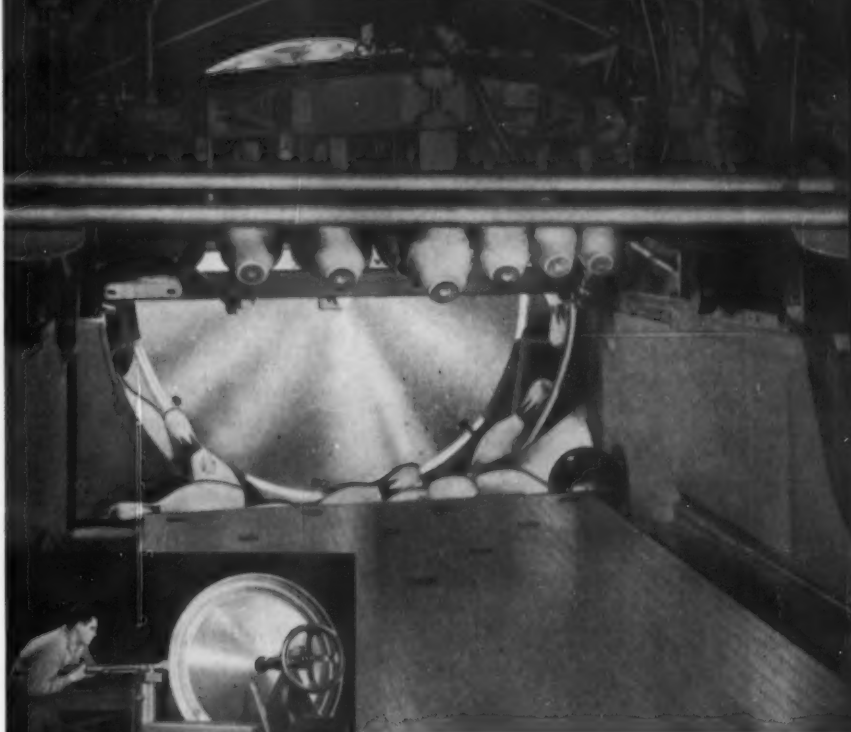
Finishing:

New enamel matches white in durability.

A new Coppertone finish, supplied as optional on the upper door of two-door Servel refrigerators, is a sprayed-on, baked enamel with the same resistance quality

Spincraft did it for  **...**

Spincraft can do it for you!



NINE DIFFERENT OPERATIONS —
Spinning and forming
tolerances to .031"

On each 5-ft. wheel, Spincraft assumed 100% fabricating responsibility: deep draw, spin, punch, blank, stamp and form, pantograph (chamfer), surface finish, drill, rivet, carton and ship. Operator (above) is spinning the 1/2-in. thick sheet of tough 52S aluminum alloy. Cross-section of basic wheel (right) shows unusual contour requirements. Raised segments are 1/2-in. cold rolled steel.



Write for Spincraft data book. If you have a specific problem, tell us about it — no obligation.

Precision wheels with a "feel" for bowling pins — another example of Spincraft's fabricating skill



By setting pins faster, American Machine and Foundry's automatic pin spotter gives more bowlers more opportunities for better scores! Spincraft is proud to have successfully fabricated a key component of the AMF pin spotter. It's the large-diameter pin elevator wheel — our solution to a difficult production problem for this well-known manufacturer.

This is one more example of Spincraft's versatility, capacity and skill. We offer complete facilities for contract manufacture of metal parts or complete units. No jobs are too big — or too small. One piece or millions are taken in stride.

Engage the facilities of the world's largest metal spinning plant — the only such plant also equipped for deep drawing, stamping and complete fabrication. You'll get results and savings that far exceed your expectations!

SERVING INDUSTRY SINCE 1919 . . .

World's largest plant fully equipped for all types of metal spinning • deep drawing • stamping • fabricating

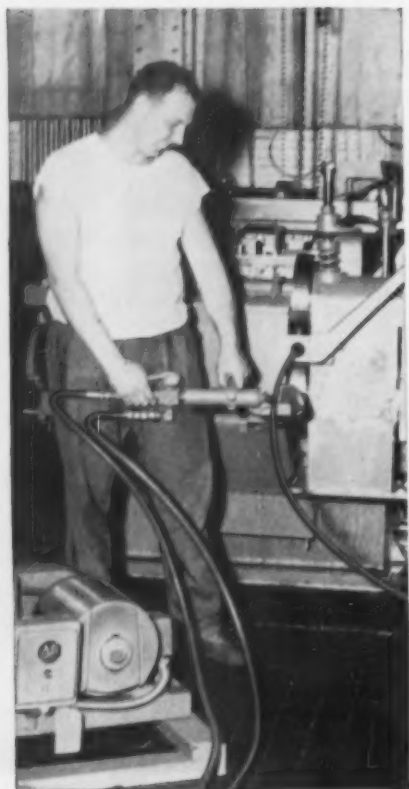


S

4140 WEST STATE STREET • MILWAUKEE 8, WISCONSIN

MANCO GUILLOTINE

Hydraulic Rod Straightener



Fast, easy to use, the Manco Rod Straightener can be operated by hand valve as shown above or by foot valve if desired.

Straightens Ends of Coiled Rod For Insertion Into Drawing Dies or Cold Heading Machines

With the new Manco Guillotine Hydraulic Rod Straightener you can quickly and easily straighten the leading end of heavy coiled rod. It takes only 15 seconds to straighten a four foot length. Capacity for 9/16" to 1 1/4" diameter rod. Powerful hydraulic action develops 10 tons thrust. Unit is equipped with Manco 3 h.p. electric hydraulic pump. Weight of head, 18 lbs. Weight of pump unit, 300 lbs.



NEW MANCO GUILLOTINE CATALOG also available on complete line of special hydraulic tools for cutting, shearing, punching, bending, riveting.



WRITE FOR COMPLETE INFORMATION

Manco Mfg. Co., Bradley, Illinois
Please Send Me:

1A-10B

- ☐ Bulletin on Rod Straightener
☐ New Manco Guillotine Catalog

Name _____

Firm Name _____

Street _____

City _____

State _____

TECHNICAL BRIEFS

of the traditional Newtone white and many times that of the copper plating used in 1954, first year of the company's dual-tone models.

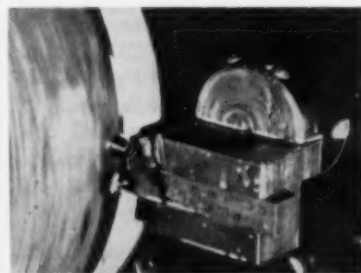
Servel, Inc., reports that both the new Coppertone and the white will withstand 100 pct humidity and 110°F temperature for 2,000 hours. And the coppertone finish costs about 50 pct less to produce.

The new finish is applied to a white primer. First, a copper powder is mixed with an organic liquid to obtain the desired shade. This is sprayed on the door surface, after which a clear coat is applied for gloss and depth. The finish is then baked for 30 minutes at 300°F.

Tooling:

Throwaway inserts cut machining costs.

Replacing standard brazed tools with new Kendex square throwaway inserts for a difficult turning job cut tool costs from \$1.20 to \$0.09 per piece recently for Menasco Mfg. Co., Burbank, Calif.



Longer-lived . . .

A 25 hp Monarch engine lathe No. 25-N was used on the job, rough and finish turning SAE 4140 heat-treated tank assemblies. Each assembly has an 11 3/4-in. diameter.

Five hundred forty-eight pieces had been turned with one holder and the estimated total holder life was 700 pieces or approximately 43 inserts. Tensile strength of the assemblies was 160,000 psi.

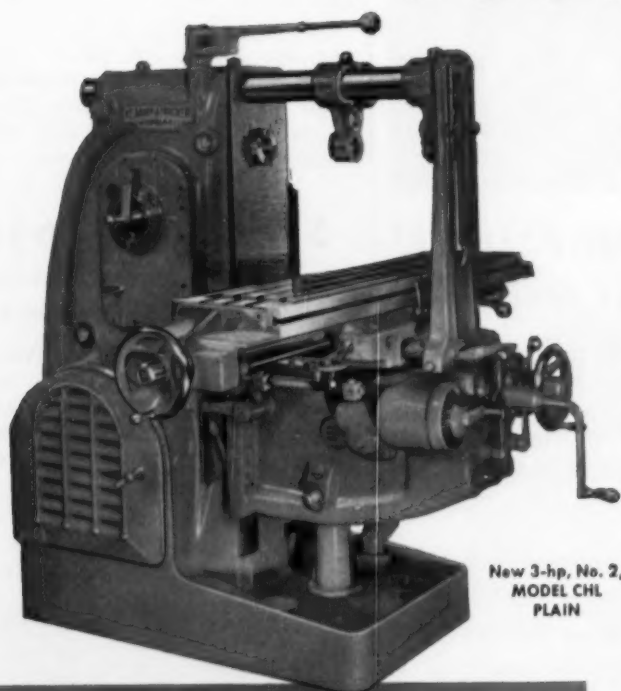
111 rpm Speed

The speed of the operation was 111 rpm and 320 sfm. The feed with two cuts was 0.014-in. while the depth of cut was 0.200-in. per

LESS THAN 23 CENTS PER HOUR

will put this new 3-hp, No. 2, Model CHL plain milling machine to work in your plant with

Kearney & Trecker's TOOL-LEASE PROGRAM



New 3-hp, No. 2,
MODEL CHL
PLAIN

NO! We didn't make a mistake. Under Tool-Lease Plan "A", one of three seven-year lease agreements offered by Kearney & Trecker, you are asked to make two semi-annual rental payments, totaling 25% of the machine's price during each of the first three years. Actually, in dollars and cents, you are asked to invest approximately 23 cents per hour for a new 3-hp, No. 2, Model CHL plain milling machine. That means a machine installed in your plant and in operation — for pennies an hour!

What's more, under Tool-Lease, you can rent any of over 250 standard milling machines or precision boring machines. All are available under three basic plans, with varying options to continue or terminate the lease, or to purchase the equipment. If you require special machinery or heavy-duty CSM bed types, special agreements will be considered.

For complete information on Tool-Lease, see your Kearney & Trecker representative, or mail coupon to Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.

MACHINE TOOL OBSOLESCENCE IS BECOMING CRITICAL! WHERE DO YOU STAND?



Here's the picture in a typical industry — GENERAL INDUSTRIAL EQUIPMENT — (see chart below). Of the 6032 standard knee type horizontal, vertical, bed and manufacturing type milling machines and precision boring machines in use today — which can be replaced by Tool-

Lease equipment — 22% are more than 20 years old, 33% are 10 to 20 years old, 55% are more than 10 years old!

Machines over 20 years old, which should definitely be replaced ☒ Machines 10-20 years old, which should probably be replaced ☒ Machines less than 10 years old ☐

605 automatic and manufacturing type milling machines



1310 vertical milling machines



3375 knee type horizontal milling machines



259 bed type milling machines



483 horizontal and vertical precision boring machines



Figures adapted from 1953 American Machinist survey of metalworking industry



KEARNEY & TRECKER CORPORATION
6784 W. National Ave., Milwaukee 14, Wis.
Please send me Tool-Lease Bulletin TL-10A and booklet titled "Critical Picture of Creeping Obsolescence," or call Milwaukee, Greenfield 6-8100.



Name.....
Title.....
Company.....
Address.....
City..... Zone..... State.....

Look overhead...see "NORTHERN"

TECHNICAL BRIEFS



NORTHERN

**CRANES for severe service!
for continuous operation!
for safety and economy!**

The 40-ton NORTHERN SUPER CRANE shown is one of several Northern cranes operating in the Huntington Works of the International Nickel Company.

From drawing board to assembly floor no effort is spared in building uninterrupted service into NORTHERN HEAVY DUTY SUPER CRANES. They are built to stand rough handling, overloading and continuous operation. Mechanically, structurally and electrically they offer the maximum in safety and operating efficiency.

Northern Cranes are backed by over 55 years experience in designing and building cranes for steel mills, metal fabricating plants, automobile plants, paper mills, electrical manufacturers, railroads, and many other industries.

Let us send you
Bulletin SE-108

NORTHERN

CRANES—HOISTS—TRAVELATORS

NORTHERN ENGINEERING WORKS

210 CHENE ST., DETROIT 7, MICH.

side roughing and 0.050-in. per side finishing. Stuart's Dasco soluble oil was used as a coolant and directed to the inside of the workpiece to reduce distortion. Coolant was not employed on the cutting edge.

Using Kendex Style KSBR-12 with Grade K4H inserts, two pieces were rough and finish turned per cutting edge. Since the turnover type insert provides a total of eight cutting edges, 16 assemblies were machined after which the insert was replaced—eliminating regrinding costs. Standard style tools used prior to the introduction of the throw-away inserts required regrinding after roughing and finishing of a single piece. And, only four regrinds were obtained per tool.

Straightening:

**High-speed machine
gives bright polish.**

Cold drawn steel bars from 5/16 to 2½ in. diam are being straightened and polished at speeds up to 300 fpm at Pilgrim Drawn Steel Div. of Automotive Materials Corp.

The variety of grades straightened includes high and low carbons, Bessemer grades and alloys.



Straightens, polishes . . .

Concentricity is controlled by the machine as it gives the bars a bright, smooth finish. Size tolerance can also be controlled by raising or lowering diameter of the bar, depending on the analysis of the grade being straightened.

Automatically Fed

The Sutton Straightener is located at the end of a straight pro-

New straightener automatically adjusts for different size tubes and bars ... has 40 TIMKEN® bearings

WHEN you switch from one size bar or tube to another, this new Sutton straightener automatically adjusts its straightening rolls to take the new size. This enables you to switch from 1 1/4" O.D. tube to 3 1/4" in less than a minute and a half!

Because straightening rolls must withstand heavy radial and thrust loads as the work passes through, they are mounted on Timken® tapered roller bearings. The taper enables the bearing to take both radial and thrust loads. Line contact between rollers and races gives them high

load-carrying capacity. The net result is accurate shaft alignment and trouble-free operation.

This straightener uses a total of 40 Timken bearings—in the idler rolls, universal joints, and drive unit as well as the driven rolls. Space is at a premium and the compactness of Timken bearings is a big advantage. Their high load-carrying capacity permits a relatively small-size bearing. And no space-taking thrust bearings are required.

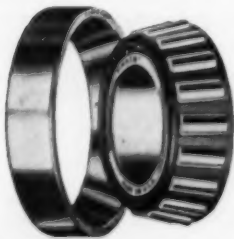
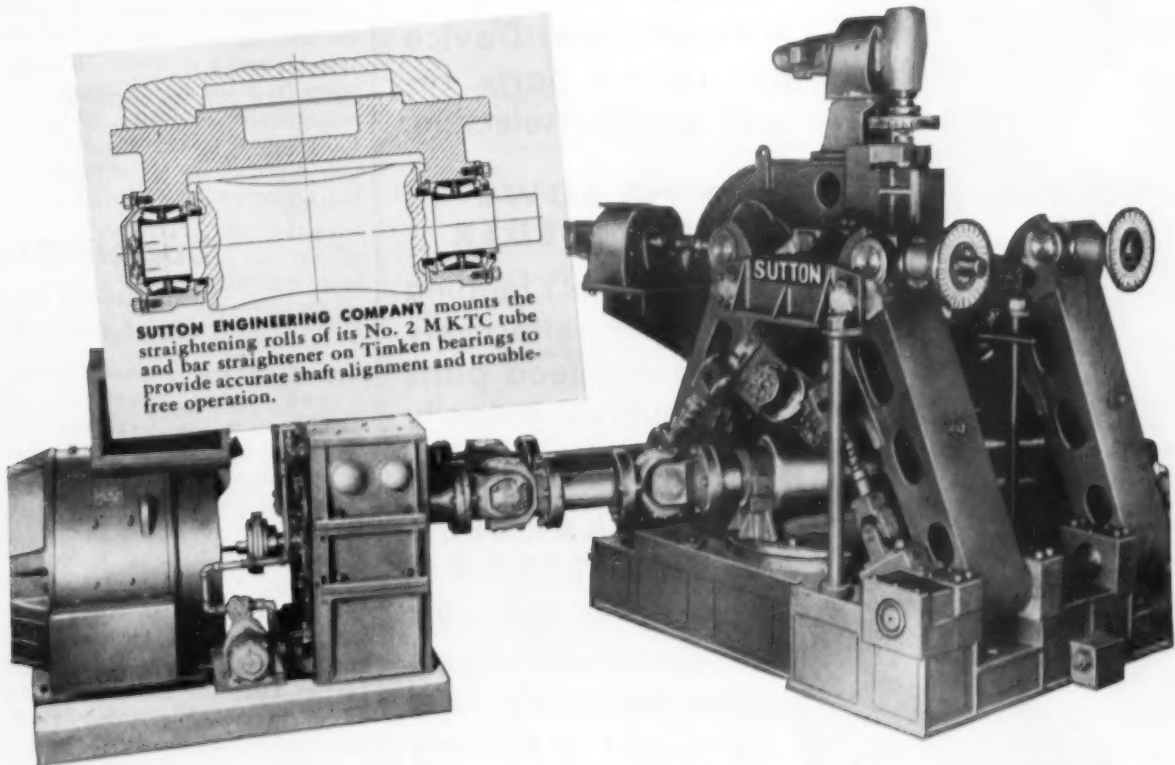
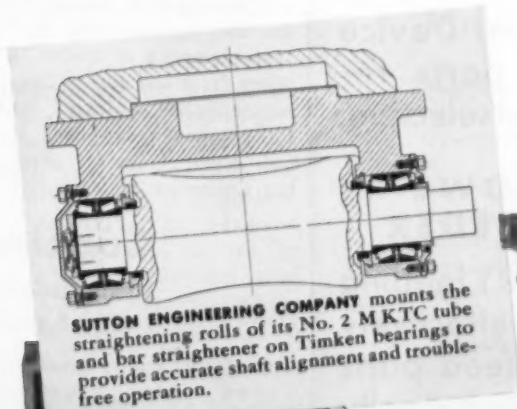
Timken bearings minimize friction because they have true rolling motion

and *incredibly* smooth surface finish. This helps provide a smooth-running machine despite the heavy variable loads. It also means longer life and minimum maintenance.

Timken bearings are a sure sign of quality on the machines you buy and the machines you build. Look for the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable: "TIMROSCO".



This symbol on a product means its bearings are the best.



TIMKEN
TRADE MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



DESIGN LEADERSHIP

The first Timken tapered roller bearing was produced in 1898. Since then the one-piece multiple perforated cage, wide area contact between roller ends and ribs, and every other important tapered roller bearing improvement have been introduced by The Timken Roller Bearing Company.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

The RIGHT COMBINATION -

for Your
PARTS FEEDING PROBLEM . . .



DPS BARREL FEEDER

A Time-Tested Device
for use on parts re-
quiring critical selection.

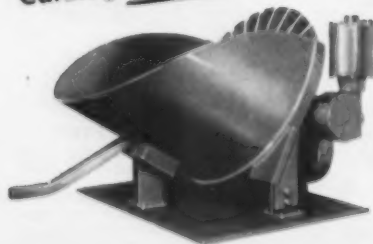
DPS BOWL FEEDER

A VIBRATORY feeding
device to effectively
select and feed parts
that could not normally
withstand tumbling.

DPS BARREL FEEDER

with STATIONARY
RING COVER, oper-
ating on Rotary Prin-
ciple, but providing
3 TIMES THE LOAD
CAPACITY of other
feeders. Designed for
heavy-duty large
production runs.

Send for
Up-to-date
Catalog **TODAY!**



**GIVE US YOUR PROBLEM
GET THE FACTS!**

DETROIT POWER SCREWDRIVER CO.

2801 W. FORT ST.

DETROIT 16, MICH.

duction line. It is tied in with a 50,000-lb. draw bench capable of drawing bars triple, double or single, at various speeds. After drawing, bars are conveyed to a pneumatic shear where they are cut to prescribed lengths, then are fed to the straightener automatically.

Bars or tubes are fed through a horizontal pass line in which two large rolls are opposed by three smaller rolls. While normally only two of the five rolls are driven, the unit has four driven rolls to provide a burnishing action which polishes as it straightens.

Quick Changeovers

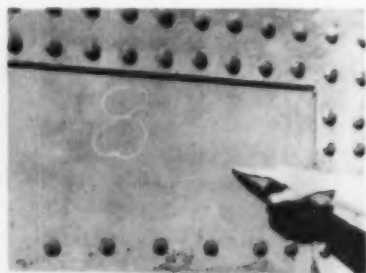
Power is provided by a 30 to 40 hp, 400 to 1600 rpm, 230 v, adjustable-speed dc motor. Changeovers from one size to another are accomplished quickly. Anti-friction bearings are used throughout. Floor space is conserved by the top-mounting of motor.

Coatings:

**Paint judged tops
after 5 year test.**

An "aluminum pigmented vinyl paint system" produced by Thompson & Co., Oakmont, Pa., was recently rated one of the best of 25 coating systems tested from the standpoint of long-time corrosion resistance.

Pittsburgh District Corps of Engineers, U. S. Army, conducts the continuing tests. These were initiated in 1949. At that time, the coating, composed of a primer coat of Vinsynite and three coats of aluminum-pigmented vinyl paint, was applied with 24 other systems of coatings to 25 sections



After 5-year submersion . . .

TECHNICAL BRIEFS

of the steel-plate lift gate of Emsworth Dam, in the Ohio River near Pittsburgh. There were seven other vinyl systems, 14 phenolic-varnish pigment paints and three rubber-base and coal tar coatings.

Normally Submerged Gate

Coatings were applied to the upstream side of the flood gate, which remains about one foot below the surface of the water at almost all times. The gate had been painted in 1943 after wire-brushing. In 1949, when the test coatings were applied, some of the old paint remained and some areas were badly rust-pitted. After careful cleaning, primers and paints were applied by brush and spray and the gate was permitted to dry for five days before submersion.

Rusting, blistering, top coats and primers were the four factors considered in rating. Seventeen observers, 12 from industry and five from the Corps of Engineers, did the judging. The industrial representatives again decided the Vinsynite-Vinyl system had stood up best to the 5 years nearly constant submersion.

Brush Application

The panels had been inspected and judged twice before. In 1950, the system tied for third place. In 1952, it was judged first.

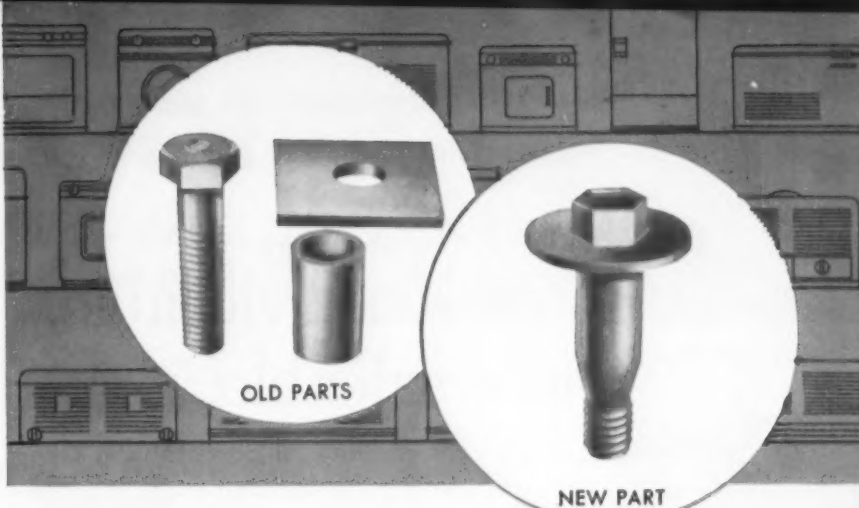
Application of the coats was by brush, with 24 hours drying time between coats. Total thickness of the four coats was six mils.

Atomic Energy:

Radioisotope finds shipboard oil leak.

Radioisotopes were used to track down the source of an oil leak aboard a 500-ft ore freighter recently, while the ship was operating on its normal schedule between ports.

Engineers aboard the SS J. S. Ashley noticed the oil condensing on the filters through which steam condensate passes before being recycled as boiler feed water. This could readily foul



This Special Townsend Part Does Work of Three—Saves Appliance Manufacturer \$25,000 Per Year

Some time ago when studying the assembly methods of a large appliance manufacturer, a Townsend engineer made an important discovery. He found that three separate parts—bolt, square washer and spacer, shown above, were being used in a critical assembly.

The three parts were assembled by hand and then brazed to form a single unit. This was a slow, costly operation. Further, the three parts tripled the inventory work.

This engineer felt that Townsend's more than a century of cold-heading experience could be used to develop one part which would do the job. It was difficult because of the large volume of metal which had to be upset to form the bolt head, spacer and

washer in one piece. After that problem was solved, the thread rolling and heat treating operations were routine.

The result—this manufacturer uses so many of these that it will mean a savings of approximately \$25,000 per year in material costs, reduced assembly time, and simplified inventory.

This is but one example of how Townsend engineers work with designers and production engineers to give them advice which makes possible improvements in their products, reduced material costs and lower assembly time.

To learn how their services and Townsend's ten thousand different types of fasteners and small parts can give you more economical production, write or use the coupon below.

THE FASTENING AUTHORITY

Townsend

COMPANY • ESTABLISHED 1816

NEW BRIGHTON, PENNSYLVANIA

Sales Offices in Principal Cities

Cherry Road Division - Santa Ana, California

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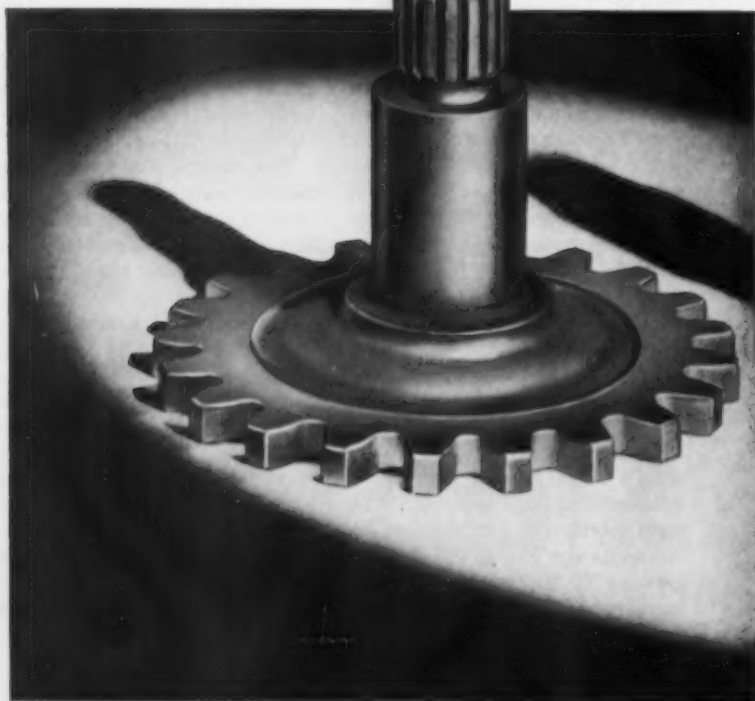
You Are Invited to Visit the **Townsend**
Demonstration and Exhibit
Booth 1371 National Metal Exposition and Congress
Philadelphia, October 17-21

Perkins custom-made Gears *make any device—big or small, simple or complex—*

*more efficient,
more serviceable,
more saleable . . .*

because every human and mechanical advantage in Gear Making goes into their production—and all under management who have spent their lifetime in the Gear Business.

You furnish the specifications we'll produce the gears!



PERKINS MAKES:

to customers' specifications, in all materials, metallic and non-metallic: bevel gears, ratchets, sprockets, ground thread worms, spiral gears, helical gears, spur gears with shaved or ground teeth.

NOTE: The PERKINS PRECISION SPRING COILER is the latest development in the spring

coiler field and eliminates entirely the use of arbors and long set-up time. It is a complete self-sufficient machine and enables you to make the spring you want when you want it—in seconds. The coiler produces any type of spring, in any diameter and any pitch with this range: Wire sizes .005 to .125. Diameter, from 3/32" to 12" and larger. Size of the compact coiler is only 7 1/2 x 16". A POWER MODEL is available. Information on request.

PERKINS MACHINE & GEAR CO.
103 Circuit Ave., WEST SPRINGFIELD, MASSACHUSETTS

TECHNICAL BRIEFS

the boilers and result in an expensive overhaul while repairmen probed to find the source of the leak and repair it. And the owners didn't want the ship out of service.

Crankcase Suspected

It was assumed the leak was in the crankcase, but rather than tear it up to see, it was decided to see if the leak might be found by means of radioactive tracers. If it showed up in the filters, engineers could go to work with a good idea of the location.

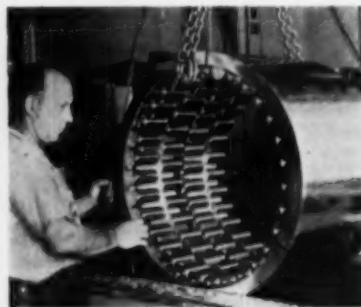
Tracerlab, Inc., prepared a small amount of radioactive iodine and this was put in the crankcase. A few hours out of port Geiger counters picked up the telltale clicks at the filter, and the initial problem of locating the leak was solved.

Rolling:

More multi-row cylindrical bearings used.

Success of multi-row cylindrical bearings in steel mill rolling applications in recent years has led to their increased use in non-ferrous fields, according to SKF Industries, Inc., Philadelphia.

Until recently, multi-row cylindrical bearings, which were de-



Wider usage . . .

signed specifically for roll neck applications and introduced in 1947, were only being used on smaller rolling mills. Now they are being specified for bigger mills, have gained wide acceptance, and may become standard equipment for future installations in the rolling industry.

time studies prove it!

**15 man-hours saved for every
400 lbs. of lubricant you use!**

Alemite cuts costs!

**all the way from barrel to bearing
...in maintenance...repairs...
down-time...**

YOU SAVE...STEP BY STEP!

You start with a saving of 15 hours for every 400 pound drum of lubricant used. But that is only the beginning. Far more important is the saving in machine down-time, lubricant and costly bearing replacement. Because this combination of plant proved Alemite equipment insures better lubricated bearings—bearings lubricated only with “refinery fresh,” protected lubricant!

There is an Alemite Hand Gun with the capacity you need—from 8 ounces to 2 pounds. With the pressure you need—up to 15,000 pounds! And there is an Alemite Loader Pump designed to fit any standard size container that you normally use. Stationary models for 100 and 400 pound drums. Portable models for 25 and 35 lb. pails.



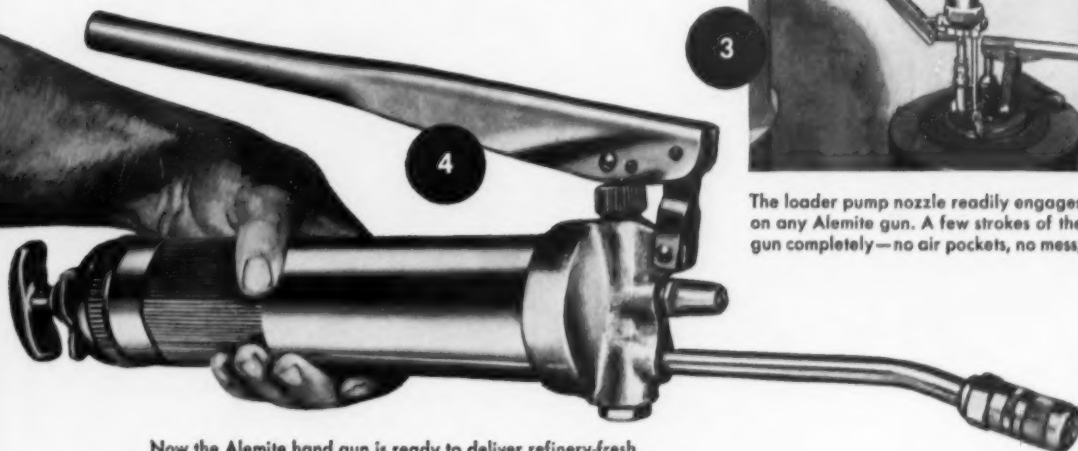
1
A drum of general-purpose lubricant arrives in the oil room. Clean, sealed, fresh from the refinery.



2
As soon as the drum is opened, an Alemite Loader Pump for hand guns is inserted, completely reseals the drum, protects against contamination.



3
The loader pump nozzle readily engages the loader fitting on any Alemite gun. A few strokes of the pump fills the gun completely—no air pockets, no mess, no waste!



4
Now the Alemite hand gun is ready to deliver refinery-fresh lubricant to any machine—lubricant completely free of dirt, grit, or abrasives—protected from barrel to bearing!

With Alemite Plan "A"

Only Refinery Clean Lubricant Reaches Machines

This combination of Loader Pumps and Alemite Hand Guns is known as Alemite Plan "A." It is one of five Alemite plans that your nearest Alemite supplier can show you. Ask him for your copy of the new Alemite booklet, "5 Plans for Better Lubrication." It will help you make lubrication plans that save money in your plant!

FREE!

**New Booklet:
"5 Plans for Better Lubrication"**

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Chicago 14, Illinois



Please send me my FREE copy of "5 Plans for Better Lubrication."

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ALEMITE

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Guaranteed Results from FURNACES • OVENS • DRYERS

in the OVER-ALL JOB by

CONTINENTAL

for military production...

Whatever your heat process problems in plant conversion for military production, CONTINENTAL has the answer.

CONTINENTAL jobs begin with analysis of the requirements, then the selection and development of proper methods for greatest results. Finally follows the design, the building, and installation of the equipment including necessary work-handling accessories and control devices—delivering a COMPLETE UNITIZED PRODUCING PACKAGE with results guaranteed.

The broad experience of CONTINENTAL offers you a prompt, sure solution to your change-over program.

CONTINENTAL INDUSTRIAL ENGINEERS, INC.
176 W. Adams Street, Chicago 3, Illinois

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PLANNED MILITARY PRODUCTION

Write for Booklet No. 135

Continental Two Chamber Annealer of the recirculating type with automatic conveyor transfers and close tolerance control for time temperature cycle.

Two Continental Continuous Controlled Atmosphere Annealers, roller rail type, complete with transfer cars and conveyor system.

Continental Stamping Annealer continuous roller rail type, complete with baskets, handling conveyors, and automatic controls for work handling and temperature cycles.

Six Continental "Top Hat" Cover Type Furnaces for bright annealing high carbon steel, complete with gas generator and automatic controlled time temperature cycling.

FURNACES
PRODUCTION LINES

CONTINENTAL

SPECIAL MACHINES
COMPLETE PLANTS

MANUFACTURERS • ENGINEERS • CONTRACTORS FOR OVER A QUARTER OF A CENTURY

TECHNICAL BRIEFS

The bearings are used extensively on back-up rolls where they take the separating load of the mill, and control gage and quality of the finished rolled product.

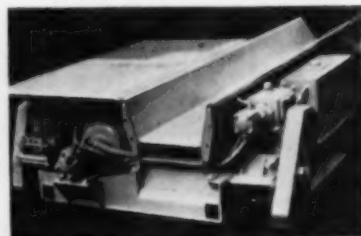
The largest multi-row cylindrical bearings built to date will be used in Kaiser's new sheet and foil rolling mill in Ravenswood, W. Va.

In other applications, the multi-row bearings have been tried and tested under almost every type of rolling conditions—2, 3 and 4-hi's, single-stand and tandem, steel, brass, copper, aluminum, uranium—strip, sheet, clads, bar and rod—hot and cold. Their performance, as well as workability within the scope of normal mill maintenance practice, says SKF, has been outstanding.

Handling:

Coal conveyor head relocates faster.

Applying a crawler drive to move bulky, stationary conveyor heads used in coal mining operations recently cut time required



Mobile conveyor head...

for moving from the former 3 to 4 hours to only 30 minutes.

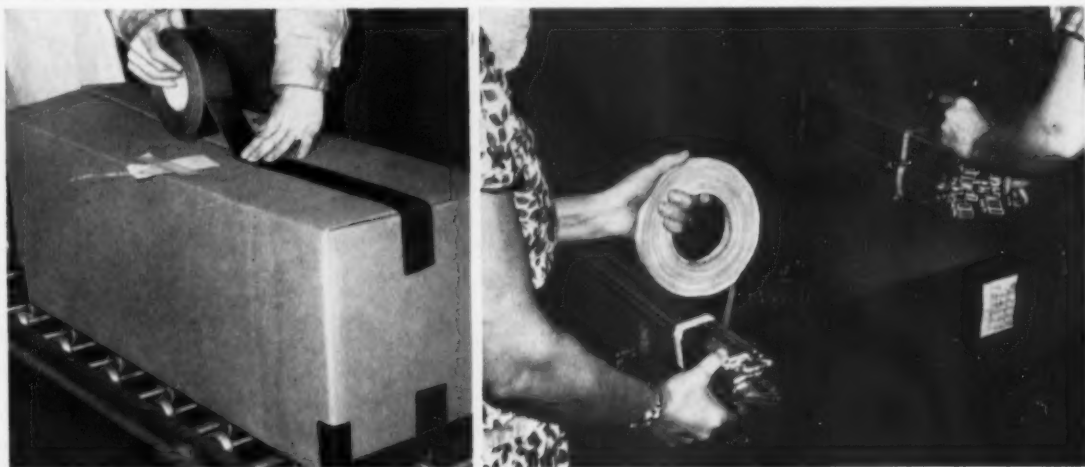
Designed and built by the Long Co., Oak Hill, W. Va., the new unit overcomes the major problem of maintaining both low overall height required for operating in thin seams of coal underground and compactness sufficient to permit sharp turns and maneuvering in cramped quarters. The unit incorporates two standard 4-in. center distance double-enveloping worm gear speed reducers, built by the Cone-Drive Gears Div. of the Michigan Tool Co., Detroit, to provide high load-carrying capac-

Polyken

TAPES

CONTROLLED STRENGTH

Do double duty at no extra cost



The container in the picture above holds an aircraft heater which is shipped in two cartons—one inside the other.

Formerly one kind of tape was used to seal the inner carton, another for the outer. Sometimes the two tapes were switched—an expensive error.

Durable Polyken Waterproof Tape now does *both jobs—at no extra cost*. In fact, packaging costs

are reduced, since the cartons are sealed more securely and there's no chance of using the wrong tape.

Polyken Tape also does an extra job in the right-hand picture. The operator in front is using it to bundle aluminum door rails. The other operator is marking the tape for identification. Polyken Tape was chosen here for both jobs because it's economical, easy to handle, comes off clean—and saves the time

and cost of tags.

The tape requirements for these jobs are not the same. Neither are the conditions under which they are used. To meet the requirements for specific jobs, Polyken Tapes have *controlled strength*—the proper combination of adhesive and backing. You get the *controlled strength* needed for your job. It's done right and it's done without waste.

Send coupon for full details.

Polyken®

INDUSTRIAL TAPES

Polyken Products Department of The Kendall Company

Polyken, Dept. 1A-J
222 West Adams St., Chicago 6, Illinois

Please send me physical properties and further information on Polyken Controlled Strength Tapes.

Name _____ Title _____

Company _____

Street Address _____

City _____ Zone _____ State _____

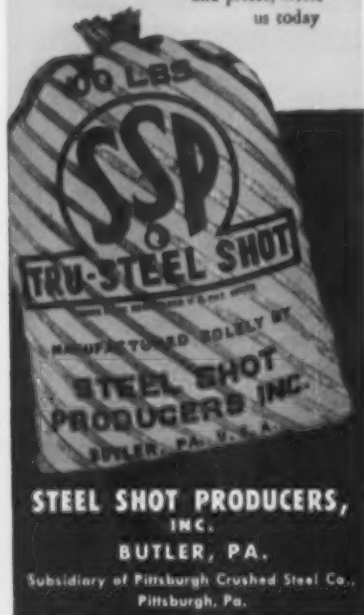
"...just common sense to use Tru-Steel!"



Right! There are 3 basic reasons why it's common sense to use Tru-Steel:

1. **Tru-Steel lasts longer.** Scientifically heat-treated, drawn to precise tolerances, it will not break into fines that cause wear of machine parts.
2. **Tru-Steel cleans fast.** Controlled chemistry and careful control checks give it the exact hardness required for fast, thorough cleaning.
3. **Tru-Steel costs less.** Yes, in sizes most popular for blast cleaning, Tru-Steel costs less than any other steel shot of comparable analysis and heat treatment.

Simple, isn't it? For full information and prices, write us today



STEEL SHOT PRODUCERS, INC.

BUTLER, PA.

Subsidiary of Pittsburgh Crushed Steel Co., Pittsburgh, Pa.

ity in an extremely compact unit.

Hydraulic motors, mounted directly on the reducers by means of adapters, drive the reducers. Reduction ratio is 30:1, and input speed 850 rpm.

Metals:

Zirconium alloy withstands corrosive action.

A new zirconium alloy is so resistant to the extremely corrosive action of high temperature, high pressure water in nuclear reactors that in a year's time only ten-thousandths of an inch of corrosion can be measured.

Called Zircaloy-2, the alloy was produced by Westinghouse's atomic power division. It was the result of months of study aimed at trying to find a structural metal capable of withstanding the intense corrosive attack of water under high temperature and pressure. Corrosion resistance of zirconium

in "superheated" water, Westinghouse reports, is greatly affected by the amount of impurities present in the metal. For example, an infinitesimal amount of an impurity such as nitrogen mixed with a large quantity of zirconium would make the difference between complete disintegration within a day, and a life of years in high temperature water.

Two Processes Used

Two operations were necessary to make pure zirconium, prior to the development of the new Zircaloy-2. The Kroll process, whereby zirconium chloride is reacted with magnesium to form a mass of "sponge" zirconium metal, was used first. Then, in order to purify this even further, the de-Boer process was used in which zirconium iodide was converted to metal on a white-hot zirconium wire.

Even this expensive doubly-purified metal frequently did not have



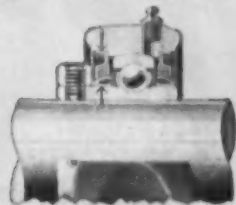
"We've used that same headline every month since the plant started using Columbia EXTRA HEADER DIE!"

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.

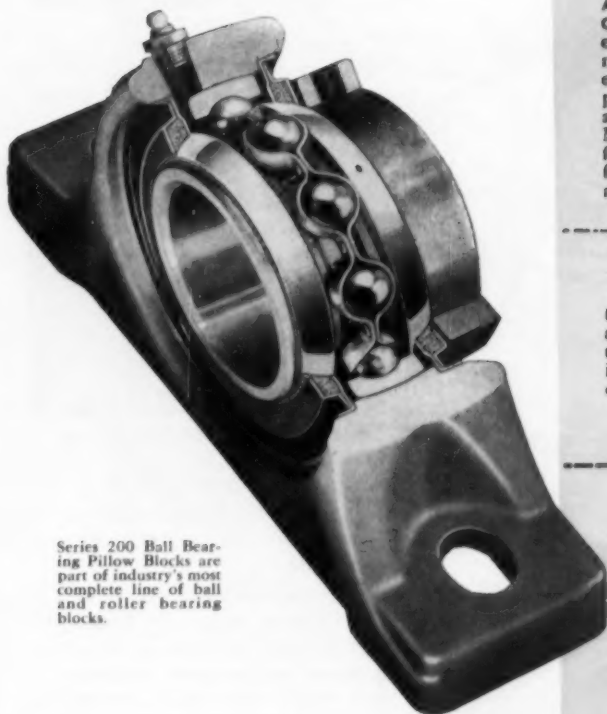
Producers of fine tool steels — All types immediately available through Sales Offices, Warehouses and Representatives in Principal Cities.



Next time you're bearing comparing . . .
look for these
important differences

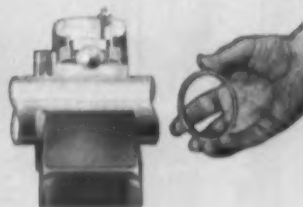


POSITIVE PROTECTION from moisture, dust and dirt is accomplished by seals extending from housing to inner ring. All aligning surfaces are enclosed in lubricant chamber.

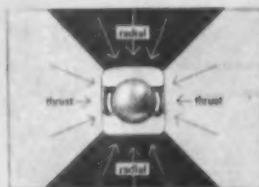


Series 200 Ball Bearing Pillow Blocks are part of industry's most complete line of ball and roller bearing blocks.

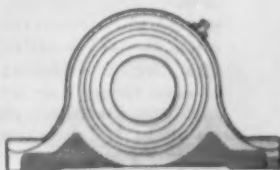
AUTOMATIC RELIEF OF EXCESS GREASE PRESSURE. Patented revolving inner seal members have escape holes enabling excess lubricant to pass out through opening around periphery of seal. No danger of seal being forced out . . . no chance for high pressure to damage bearing.



HIGHEST CAPACITY obtainable to carry heavy radial, thrust or combination loads is provided by single-row, deep-groove design.



GREATER STRENGTH. Base of block is cored to provide uniform metal thickness, assuring a sound casting, free from distortion.



*They're all present
only in LINK-BELT
ball bearings*

LINK-BELT

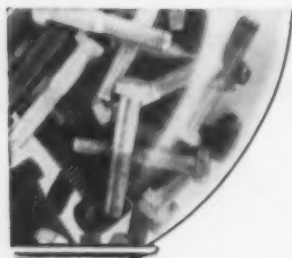
Ball and Roller Bearings

October 13, 1955

THESE important bearing differences show up in the performance of your equipment. For instance, a bearing may be subjected to shaft misalignment throughout its working life. Link-Belt's lubricated self-aligning feature assures free rolling . . . maintains maximum efficiency under any service condition. And Link-Belt alone offers that advantage in both ball and roller bearing blocks.

Whatever your bearing requirements, look to Link-Belt. All types and sizes of Link-Belt bearings are available from stock. Ask your Link-Belt office or authorized stock carrying distributor for Data Book 2550, containing complete information on the entire Link-Belt line.

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarborough (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,714-A



...the perfect way
NOT
to buy fasteners!



When you purchase FASTENERS, your first considerations should be given to quality, delivery and prices. Chandler, as a leading manufacturer of cold forged cap screws, takes the same considerations. Mass production is only part of their story... but absolute control during every phase of production means top quality and uniformity.

Realistic pricing is important... and is followed.

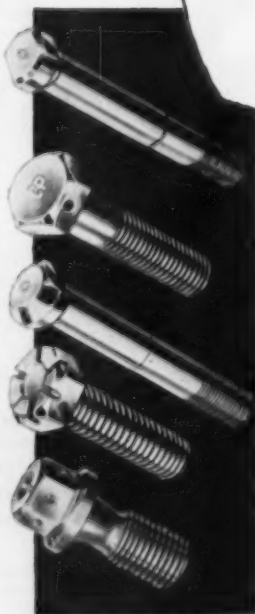
If your requirements include automotive, Place self-locking, connecting rod or aircraft engine bolts in high carbon alloy and stainless steels, check with Chandler today. They are prepared to produce special heads, drilled heads and shanks, and ground bolts to tolerances as close as 0.0005-inch.

Write today for literature.

Specialists in Thread-Rolling
after Heat Treating.



1434 Chardon Road • Cleveland 17, Ohio



TECHNICAL BRIEFS

good enough corrosion resistance, so small amounts of other metals were added to zirconium to make corrosion-resistant alloys. Of all elements examined, tin was found to be most satisfactory in that it did not absorb many neutrons and it counteracted the harmful effect of some of the impurities.

The new alloy contains 1.5 pct tin, .12 pct iron, .10 pct chromium and .05 pct nickel.

Methods:

**Aluminum windings
reduce coil costs.**

A new method for winding electromagnetic coils with strips of aluminum foil or thin alumi-



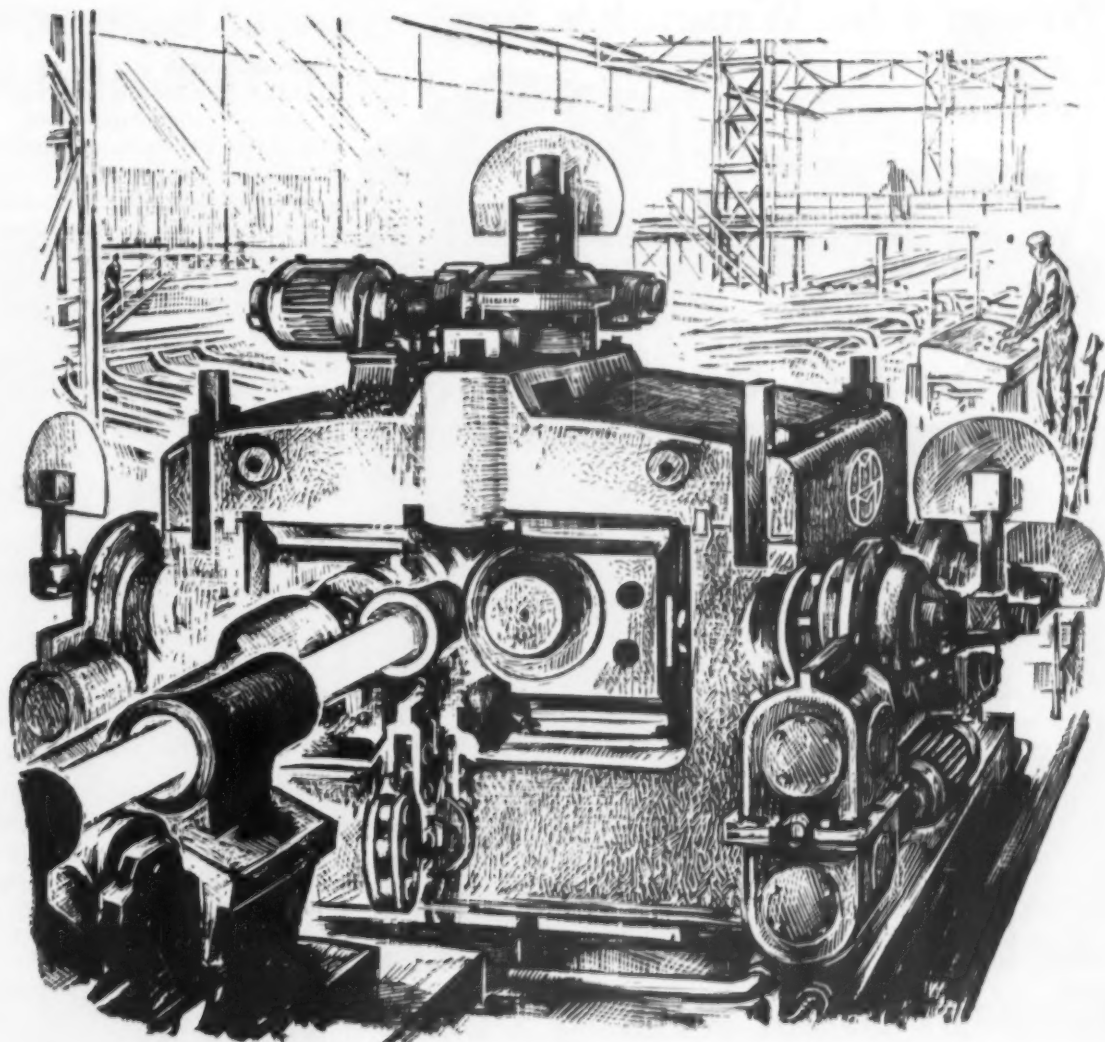
Lower cost windings...

num sheet instead of with the conventional electrical wire is expected to substantially reduce coil costs.

Construction of coils for use in transformers, solenoids and some motors and generators was announced by Reynolds Metals Co., Louisville, Ky. The new spiral winding of coils utilizes anodic coatings for aluminum which serve as insulation for the strips of metal, replacing the paper, glass or enamel insulation normally used with wire coils. Thus lightweight, compact coils capable of operating at high temperatures and with excellent heat dissipation features can be produced.

Less Space Needed

In most equipment where the space factor is important, the development makes possible the use of aluminum as magnet conductor with no increase in the size of



Do You Think Your Reelers Are Heavy Enough?

Most seamless mill operators do not think so! Attempts to speed up production of automatic seamless mills usually are stopped at the reelers because they are not heavy enough to take on more work at higher speeds.—Mannesmann-Meer's modern automatic seamless mills are equipped with heavy reelers of the most advanced design. Working rolls have angular adjustment in both planes to allow for variation of the feed angle which will provide ideal rolling of a wide range of sizes and grades of steel. With Mannesmann-Meer reelers it is possible to roll with an expanding pass and still to get good smoothing action.—

Mill design is considerably simplified by driving each roll with a separate motor. A rugged inlet table design features closed barrel guides to end danger and trouble from split guides. Roller type mandrel bar steadiers make possible smoother reeling operation.—In addition to all of these features Mannesmann-Meer reelers are especially designed for quick schedule changeovers.

Why don't you call us in to see what Mannesmann-Meer's outstanding combination of

- CREATIVE ENGINEERING
- DESIGN EXPERIENCE
- OPERATING BACKGROUND
- AMERICAN MANUFACTURING SKILL

can offer you to modernize your seamless mill.



MANNESMANN-MEER

ENGINEERING AND CONSTRUCTION COMPANY, 900 LINE STREET, EASTON, PENNA

WORLD SPECIALISTS IN HIGH-SPEED TUBE MILL MACHINERY

Newest John Wanamaker Store



Cuts Cost of "In-And-Out Handling"*



with

Kinnear Steel Rolling Doors

* "In-and-out handling" is involved wherever merchandise or materials must be moved through doorways—in shipping, receiving, warehousing, processing, or production scheduling. It takes a continuous bite out of profits if door equipment isn't of highest efficiency.

That's why, along with such time-savers as loading platforms that adjust quickly to any level, this newest John Wanamaker store features Kinnear Steel Rolling Doors.

You see one of these doors in action above. Note that it opens and closes straight up and down. Merchandise stacked door-high or higher, only an inch or two inside or outside the door, won't hamper its operation.

The door coils compactly above the opening, out of the way and safe

from damage. Wind can't slam it shut or bang it back and forth.

When closed, Kinnear Rolling Doors give all-steel protection against wind, fire, weather, theft, and vandalism.

Heavy galvanizing (1.25 ounces of pure zinc per square foot, ASTM standards) gives the rugged steel curtain extra resistance to corrosion.

In addition, a special Kinnear Paint Bond makes field-applied finishes cover better and adhere longer.

In industrial and commercial applications alike Kinnear Rolling Doors offer "more, for less, for longer".

Built any size, for old or new construction, with motor, manual, or mechanical operation. Write for information on any door need.

The KINNEAR Manufacturing Company

FACTORIES:

1740-80 Fields Avenue, Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Agents in All Principal Cities

KINNEAR
ROLLING DOORS

SAVES
WAYS
IN
DOORWAYS

TECHNICAL BRIEFS

the equipment.

The thin anodic coating consists of aluminum oxide, only 2/10,000 in. thick, a chemically inert material and an excellent electrical insulator, with a melting point higher than that of aluminum itself. In most cases, the coil weight is approximately one-half that of a comparable copper unit.

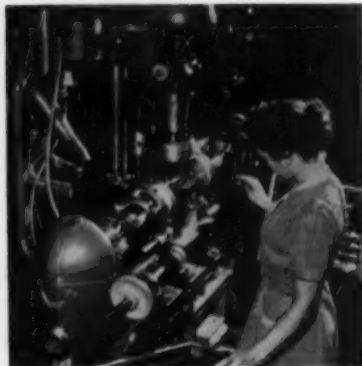
The winding process readily lends itself to mechanization and resultant low-cost production methods.

Methods:

Setup machines parts fast, economically.

Precision machining of camera bodies and a flash attachment is being handled economically by Whitehouse Products, Inc., Brooklyn, N. Y., with production machinery of its own design and building.

The problem was one of economics. Production requirements were sufficiently large to rule out single drilling of the complex components, yet not large enough to warrant investment in expensive machine tools. So the ar-



Economical drilling . . .

range of nine 14-in. high-speed Delta drill press heads, in a multiple-unit arrangement so they can be operated either individually or collectively, was devised.

600 Pieces Per Hour

Machining the flash attachment calls for three drill press heads to drill eight holes and perform a

"Economical Buying of Screw Machine Products Now Calls for Greater Care in Specifications,"

says Leonard Schaffer, President, Mechanical Art Works, Inc., Newark, New Jersey



A few typical fine-finish, close tolerance screw machine products currently produced from ANACONDA Rods at the Mechanical Art Works.

"The tremendous versatility of automation in modern manufacturing has placed a bigger burden on the designer and buyer of screw machine parts," Mr. Schaffer explains. "The trend toward miniaturization has shifted many more parts to the screw machine. And the screw machine's ability to provide *tolerances* as close as .0005", and finishes heretofore obtainable only by centerless grinding, has left a tremendously wide choice in specifications."

Mr. Schaffer, a long-time user of Anaconda products, says, "I can count on the uniform machining characteristics of ANACONDA Rods from batch to batch, which is important for both quality and economy in my business."

For complete data on composition and machinability of standard ANACONDA Alloys, standard specifications, weights and dimensions of standard rods, write for Publication B-14. Address: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

5589

A few of Mr. Schaffer's suggestions to buyers of screw machine products for keeping costs down.

Wherever possible, the largest diameter of the piece should correspond to a standard stock rod diameter.

Avoid fancy shapes calling for expensive forming tools.

Use hole diameters obtainable with standard tools.

Allow commercial tolerances if possible, otherwise specify tolerances no closer than necessary.

Specify Standard National Coarse or National Fine Threads wherever possible.

On external threads, cutting full threads close to a shoulder is expensive—and may be unnecessary.

Tapping blind holes close to the bottom is difficult and costly.

Specify free cutting material unless special physical properties are required, then select the best machining material containing those properties.

ANACONDA[®] RODS FOR SCREW MACHINE PRODUCTS

October 13, 1955

141

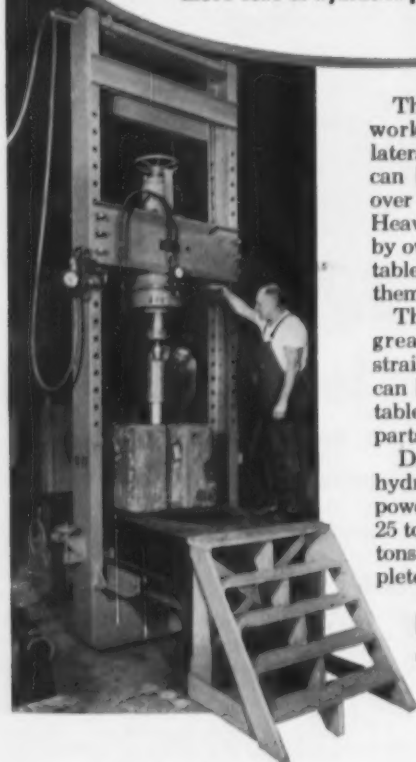
deburring operation at the same time. Two opposed horizontal drill press heads equipped with three spindles each drill electrical contact and hinge holes on the sides of the unit. At the same time a vertical-mounted two-spindle drill press head drills two holes through the flash attachment fastener while it deburrs a 1¼-in. reflector hole on the flash housing. Production rate on the at-

tachment is 600 pieces per hour.

In machining camera bodies, one unit made up of four drill press heads drills 16 holes simultaneously at a rate of 300 pieces per hour. The other unit, used for operations on the back cover of the camera, consists of two drill press heads automatically drilling five holes simultaneously. Production rate for this sequence is 450 pieces per hour.

Designed for awkward, heavy hard-to-handle pressing jobs

With this Dake Movable Frame Press you can move tons of hydraulic power over your work.



The frame moves lengthwise over the worktable, and the workhead moves laterally along the frame. Thus the ram can be placed anywhere it is needed over the extremely large work area. Heavy, awkward parts can be moved by overhead crane or hoist to the worktable, and the power centered above them.

The extra large table area gives a greater capacity for bending and straightening work, too. Support points can be spread to extreme edges of the table for long or irregularly-shaped parts.

Dake Movable Frame Presses are hydraulically operated, and may be powered either by air (in capacities of 25 to 150 tons) or electricity (25 to 300 tons). Write for Bulletin 269B for complete description and specifications.

DAKE CORPORATION

602 Seventh St., Grand Haven, Mich.

Pressing the battering point into the hammer of a pile driver with a Dake Movable Frame Press.



Send for Big New Catalog

DAKE CORPORATION
602 Seventh St., Grand Haven, Mich.

Please send me a copy of Dake Bulletin 269B

Name _____
Company _____
Address _____
City _____ Zone _____ State _____

Machining: Lathe finishes mill rolls in less time.

An electronically - controlled contour turning lathe which can finish and redress mill rolls in a fraction of the time needed with conventional roll lathes has been shipped to the Indiana Harbor Works of Inland Steel Co.

Made by Mackintosh-Hemphill, Div., E. W. Bliss Co., the new lathe, of nominal 40-in. swing, will be used for work on shape rolls up to 18 ft long with outside rough diameters as great as 50-in.

Fully Automatic

The lathe is fully automatic in operation. Its carbide cutting tool



Has 40-in. swing . . .

is moved by independent long-feed and cross-feed motors reproducing on the roll body required contours identical with those of a full-sized template through stylus contact with template. Reproduction accuracy can be held to 0.001-in., and smooth cuts made on a shoulder normal to the roll axis.

The new lathe removes metal up to nine times as fast as manually-controlled roll lathes. It will operate continuously through maximum cut depth of ⅞-in., with feeds of 0.060-in. to 0.100-in.

Testing:

Ultrasonic effects on materials studied.

A research program to determine the ultrasonic effects of jet engine noise and aerodynamic friction on various aircraft materials is under way in the engineering test laboratory at Fort Worth plant of Con-

TECHNICAL BRIEFS

vair, a division of General Dynamics Corp.

Engineers and chemists are studying the effects of frequencies of 20 kilocycles and up on fuels, lubricants, hydraulic fluids, plastics, and adhesives, as well as possible changes in explosive limits of fuel. Data obtained will help in designing future aircraft to withstand any possible effects of intense ultrasound.

Test Procedure

Using an ultrasonic generator capable of 400 watts sound output power, ultrasonic energy is transmitted through a coaxial cable to a bowl-type barium titanate transducer. Test tube samples are immersed in a coupling fluid in the transducer so that samples are at the focal point of the concave transducer. This submits the sample to radiation at the point of maximum sound energy. Energy absorption is evidenced by the release of dissolved gases, cavitation and its resultant geyser on the specimen surface, and by a vapor cloud above the liquid.

To determine ultrasonic changes produced in the samples, physical and chemical tests are made on the specimen both before and after ultrasonic exposure.

Other Tests

Liquid sample tests being made include density, refractive index, viscosity, flash point, acid-base number, spontaneous ignition temperature, distillation range, and infra-red spectrometer scans.

Fuel explosive limits are determined in a 27-liter steel chamber equipped with a spark plug detonator and means for volatilizing the fuel, stirring the air-gas mixture, and a large flap valve for releasing explosion pressures. After determining upper and lower fuel explosive limits at room temperature and atmospheric pressure in the steel chamber, portions of the mixtures are transferred to a smaller chamber encased in a cylindrical transducer. The explosive composition limits are again determined with the fuel air mixtures under the influence of ultrasonics.

STOCK HOUSE OR HIGH LINE

operators prefer the **DEPENDABILITY of ATLAS CARS**

These specially designed units are another example of the ruggedness of Atlas Cars. Their dependability helps maintain the most rigid furnace charging cycles.



40-TON SCALE CAR
Double Hopper Bottom Dump



75-TON ORE TRANSFER
Gable Bottom Double Side Dump



THE ATLAS CAR & MFG. CO.

ENGINEERS

MANUFACTURERS

1140 IVANHOE RD.

CLEVELAND 10, OHIO, U. S. A.

TRY ONE OF THESE THREE

...and SEE!

Revolutionary, new type abrasive—cut from high-quality alloy steel. Work-hardening—outperforms all others!



Chilled shot and grit—for blast cleaning of large, heavy jobs. Unexcelled for toughness, long life, better cleaning.



Malleable shot and grit—for less severe cleaning and scale removal. The finest malleable shot on the market!



Yes, it's the thing to do! Select the METAL BLAST abrasive that suits your needs—try it—and find out for yourself what it will do for your cleaning operations! You will soon learn why so many cost-conscious foundries have changed over to METAL BLAST abrasives! Send for a trial order—TODAY!

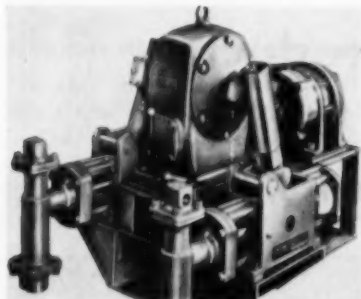
THERE'S A
METAL BLAST
ABRASIVE
FOR EVERY CLEANING
REQUIREMENT

METAL BLAST, INC.

872 EAST 67th STREET • CLEVELAND 3, OHIO

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 121 or 122



Pumps for pressures to 50,000 psi

A series of high-pressure, reciprocating plunger pumps for pressures to 50,000 psi are announced. Of the controlled capacity type, they are suitable for accurately metering output from a minimum of 2 cc per hour to a maximum of 15,000 gph. They are available in simplex, duplex, triplex and quadruplex types, all adaptable to manual and

automatic control. Pumps are suitable for feeding water treating chemicals into high pressure steam boilers and as boiler water makeup pumps. A unique design permits a reduction in horsepower normally required for the pressures involved of as much as 30 pct. *Philadelphia Pump & Machinery Co.*

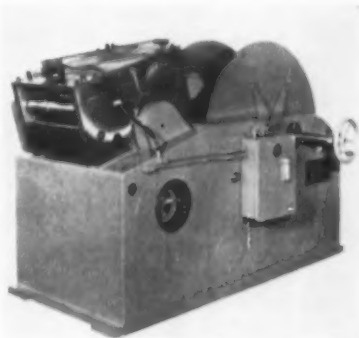
For more data circle No. 23 on postcard, p. 121.

Cradle-straightener handles coiled stock

Models of a combination cradle and straightener for coiled stock handle coils as large as 36 in. wide, 60 in. in diam, and weighing 20,000 lb. The cradle has either hardened rolls or a slat conveyor for holding the coils and is powered by a variable speed reducer. Rate of stock delivery is easily adjustable to meet a wide range of speed requirements. Rotating side plates which

turn on Timken roller bearings prevent crimping or damaging the edges of the stock. Adjustment for various coil widths takes little effort. The straightener is capable of handling up to 3/16 in. thick stock, has 2 sets of powered driving rolls and either 5 or 7 straightening rolls. *Special Engineering Service, Inc.*

For more data circle No. 30 on postcard, p. 121.

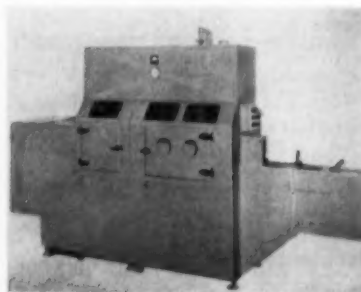


Wet blast unit finishes jet compressor blades

Automatic pressure blast unit finishes jet engine compressor blades. Both sides of the airfoil section are finished at the rate of approximately 200 per hr, removing heat treat scale and discoloration without stock removal or distortion. The unit incorporates a rinse facility for the removal of abrasive compound after blasting. Blades

are manually loaded on simple workholding fixtures which grasp at the root. A conveyor indexes blades into the blasting chamber where moving guns actuated by an air hydraulic cylinder accomplish finishing. Blades are then automatically indexed into the rinse cabinet. *Cro-Plate Co., Inc.*

For more data circle No. 31 on postcard, p. 121.



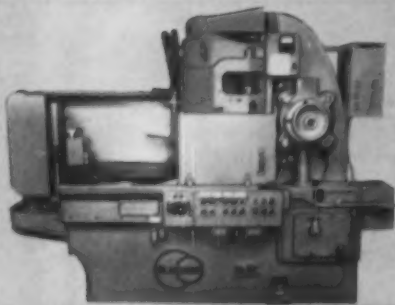
Loads and unloads dies from either side or end

An ambidextrous die handling industrial truck makes it possible for manufacturers to place metal-working presses closer together, saving valuable floor space. The unit's side-loading mechanism is of the motorized pin type, which permits handling from either side. Dies are loaded and unloaded from

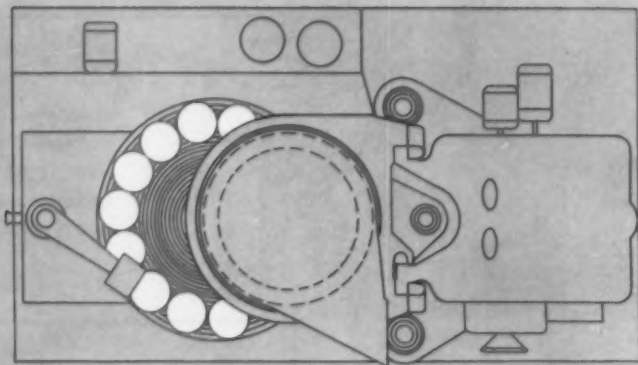
the end of the truck's platform by means of two powered winches. Drums and sheaves are used to load and handle dies and these are retractable, giving the unit a total width of 50 in. Lifting range of the equipment is 65 in. *Automatic Transportation Co.*

For more data circle No. 32 on postcard, p. 121.



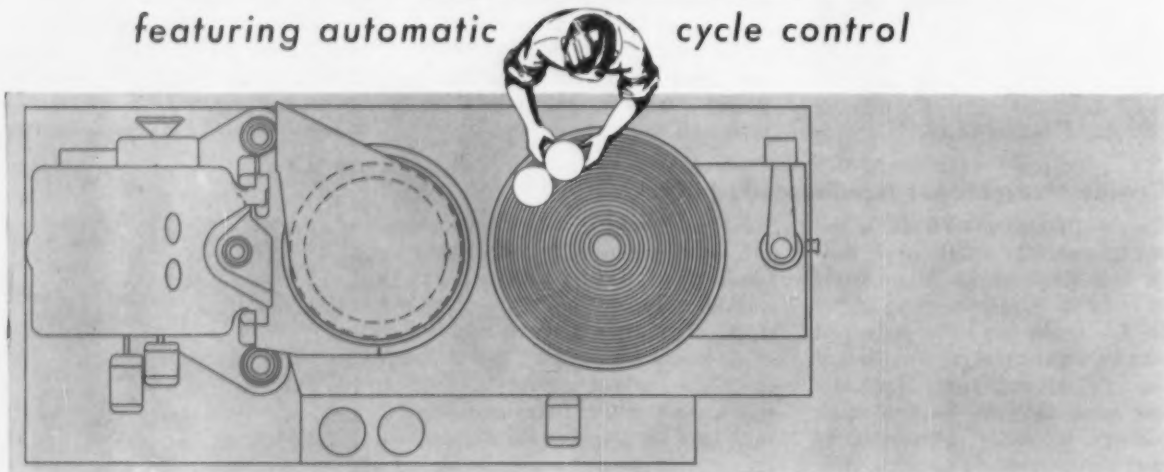


NO. 18-C BLANCHARD SURFACE GRINDER



Plan for more profitable production with this new Blanchard Grinder

featuring automatic cycle control



This great new Blanchard has the speed and simplicity which guarantee economical grinding on a wide variety of jobs.

One operator can easily operate two of these automatic cycling surface grinders. By using the automatic cycle, he can unload, clean and reload one grinder while the other grinds automatically.

The automatic cycle does everything else: moves chuck (30" or 36" dia.) to grinding position and starts it rotating; starts wheel rotation

and coolant pump; provides rapid wheel approach to work; engages power down-feed at preset rate; changes to fine feed just before finished size is reached; stops feed when work is to size — "sparks" out; raises wheel head; stops wheel, coolant pump and chuck; moves chuck to loading position—demagnetizes chuck.

The No. 18-C also features: push button selection of manual or automatic operation; automatic size control; simple feed and head traverse controls; adjustable dwell timer.

This new Blanchard offers you many new production advantages. Look into them today — write for free catalog showing work done on the No. 18-C.

PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY

64 STATE ST., CAMBRIDGE 39, MASS., U. S. A.



Machine slots 52,000 screws hourly

Capable of delivering nearly 52,000 slotted blanks per hour, the Model 5 screw head slotter slots standard or special headed, ferrous or non-ferrous blanks, #6 to 1/4-in. diam up to 2 1/2-in. long, at variable speeds from 60 to 864 per minute. To handle other blank diams, the machine can be equipped with special dials. Its simplicity and rapid setup

make the Model 5 economical for short run operations, while its high speed is a major advantage on long production runs. The only tooling required for the equipment is a saw and burr-remover blades made inexpensively from spring steel. *Waterbury-Farrel Foundry & Machine Co.*

For more data circle No. 33 on postcard, p. 121.

Handles dies or molds measuring 36 x 75 in.

The new Model 1014 die handler will handle dies or molds measuring 36 x 75 in., weighing up to 6000 lb. Its top platen is of cast Meehanite and is raised and lowered with heavy precision lead screws, driven by a 2 hp electric motor mounted in the base. Under power, the top platen rises at the

rate of 12 ipm. Fine adjustments in position can be made with an auxiliary hand crank. The platen can be rotated with power supplied by a 3/4 hp electric motor. It is also equipped with an auxiliary hand crank for rotational movement. *Hansford Mfg. Corp.*

For more data circle No. 34 on postcard, p. 121.



Measuring magnifier for metalworking industries

A seven-power industrial measuring magnifier for use in metalworking and other precision industries has four scales to measure radii, line thickness, angles, and metric distance, lineal, and other dimensions. One scale provides all these measurements. Others are for specialized work: check size of small holes, wires, and fine threads, gages, template, and layouts. Dies,

finished work, and wear on the edges of cutting tools can also be examined. The instrument can be used as a magnifier alone without the scales. Clear plastic sides permit full illumination of the object being studied. A plastic carrying case provides convenient storage for the magnifier. *Bausch & Lomb Optical Co.*

For more data circle No. 35 on postcard, p. 121.

Positioner handles weldments to 500 lb

The WP-1 welding positioner is designed for use as a bench model for faster production of smaller fabrications. With its 24-in. table in a horizontal position, it stands 15 7/8 in. high. It weighs 100 lb and handles weldments to 500 lb. Rotation of the turntable can be done manually or with electric-

motor drive at speeds from 0.18 to 4.47 rpm in graduated stages. Pushbutton remote control furnished with electric model is an advantage in automatic welding. The table can be tilted 135° from the horizontal position. *Harnischfeger Corp.*

For more data circle No. 36 on postcard, p. 121.

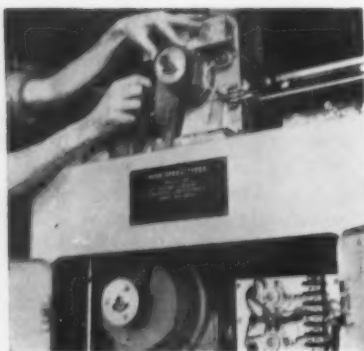


Loading platform carries increased range of loads

Loads weighing between 10,000 and 20,000 lb are lifted on a new model Load-O-Matic. In this two-post model the load on the platform is evenly distributed between the two hydraulic cylinders which support the platform at its ends. Up and down movement of the Load-O-Matic is started by an automatic

switch bar, tripped as vehicle moves onto the platform. The platform is automatically stopped at the exact level of the truck floor by an automatic leveling ramp which bridges the space between the platform and the truck. *Field Engineering Co.*

For more data circle No. 37 on postcard, p. 121.



The Gilmer timing belt is made of rubber and fabric with integral teeth that mesh positively with the belt pulleys. It will attain speeds up to 16,000 fpm, will not slip, and is said to operate more quietly than precision gears running in an oil bath. Pulleys can be die cast, sintered metal, pressed metal or machined. The timing belt is not limited to power transmission applications; for example, it can also

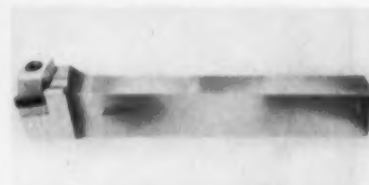
Non-slip belt for speeds to 16,000 fpm

be used as a functional part, in a synchronized conveyor. Other successful uses, applications of the timing belt include commercial sewing machines; floor polishers, sanders, saws and other portable tools; automobile fan belts; electric typewriters; automatic screw machines; and high speed pumps. Many stock sizes are available. New York Belting & Packing Co.

For more data circle No. 38 on postcard, p. 121.

Toolholder

Thro-Way toolholder for carbide throw-away inserts features an adjustable carbide-surfaced combination chipbreaker and top clamp which is said to give perfect chip control. Foolproof operation is claimed for the new toolholder, the chip breaker clamp being fully and instantaneously adjustable on an interlocking serrated friction table



designed to prevent back movement even on the heaviest cuts. The clamp can be adjusted to give maximum depth of cut without chip interference. An indexable and replaceable hardened tool steel anvil is securely held in position to assure positive seating of the carbide throw-away insert. Adamas Carbide Corp.

For more data circle No. 39 on postcard, p. 121.

Coated steel tape

Plastic covered metal tape, trademarked Met-L-Tape, is basically a high tensile steel strap like that used for heavy packing. Over this is extruded any of three plastics: vinyl, nylon or polyethylene, the plastic forming a thick coating that protects the metal from corrosion. Met-L-Tape can be fastened by bolts or rivets or, by stripping a section of the plastic to expose the metal, it can be spot welded. Coatings are available in any color and can be heat sealed at the cut ends. Garrison Co.

For more data circle No. 40 on postcard, p. 121.

O-O-O-OH! WHAT YOU MISSED... if you didn't get to see these **POPE** PRECISION PRODUCTS at the Machine Tool Show!

EXHIBIT A The NEW POPE SUPER-PRECISION BORING MACHINE

that bores holes round within millionths of an inch—table actuation all electrically controlled—feed and traverse rates infinitely variable—automatic cycle, including loading if desired—angled table and bridge for extreme ease of loading and unloading.



EXHIBIT B



POPE 1 HP, TOTALLY ENCLOSED 3600 RPM MOTORIZED, CARTRIDGE TYPE PRECISION SPINDLES with double row cylindrical roller bearings and separate thrust bearings for no endwise movement of the shaft

EXHIBIT D



POPE HEAVY DUTY, 1/4 TO 100 HP DIRECT MOTORIZED SPINDLES

for Horizontal or Vertical Skin Milling, Grinding, Milling, Boring and Other Operations

EXHIBIT F



POPE HEAVY DUTY VEE-BELT DRIVEN, PRECISION MILLING SPINDLES, and Wheel Heads, 1/2 to 50 HP

EXHIBIT G



POPE INTERNAL GRINDING SPINDLES for Cincinnati, Norton, Landis and Hould Grinders and Springfield Vertical Grinders

EXHIBIT C



POPE HIGH SPEED VERTICAL OR HORIZONTAL ATTACHMENTS for 6" x 18" surface grinders at 15,000 RPM

EXHIBIT E



POPE SUPER-PRECISION MOTORIZED TOOL AND CUTTER GRINDER SPINDLES with clearance Angle Swiveling Heads for Angular Adjustment in A Vertical Plane

EXHIBIT H



POPE SUPER-PRECISION HIGH FREQUENCY HEAVY DUTY GRINDING AND MILLING SPINDLES for speeds up to 100,000 RPM

WRITE FOR COMPLETE SPECIFICATIONS, PRICE AND DELIVERY

No. 105

Specify **POPE**
PRECISION SPINDLES

POPE MACHINERY CORPORATION
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Choice Industrial Site in Gary, Indiana

(Known as the Gary Armor Plate Plant)

LAND, BUILDINGS, MACHINERY ARE ALL TO BE SOLD!



Grow with the Booming Chicago Area

You've seen the big, and getting bigger, Chicago Area written up in national magazines...you know the rich potential, the skilled labor supply and the abundance of necessary resources this district holds. Now, here is your chance to make the move to capitalize on these big advantages.

Sixty-four buildings with approximately 1,200,000 sq. ft. of floor space are available on this site for steel production, automotive or truck assembly, railroad repair shop, metal fabricating shop, warehouse or distribution center or many other profitable uses.

Look into this golden opportunity to acquire the space and facilities you need in the area that's unmatched for dynamic enterprise. Send the coupon below now for complete details on this plant and site.

**For the required Bid Form G-IND-415
and further information send the coupon today to:**

**GENERAL SERVICES
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U. S. Courthouse, Room 575, Chicago 4, Illinois

GENERAL DATA—Sixty-four buildings with well equipped rolling mill, heat treating department, and finishing shop. All utilities available. New York Central and Elgin, Joliet & Eastern Railroads serve the site. Many arterial highways nearby. Original acquisition cost totals approximately \$20,000,000. About 53 acres of land fee owned, approximately 9 acres under lease from New York Central R.R.

This property has been screened against the known defense and other requirements of the Federal Government.

This advertisement is not a basis for negotiation and General Services Administration reserves the right to accept or reject any or all offers.

Sealed Bids will be opened 2 P.M. CST Nov. 22, 1955.

**General Services Administration, Room 575
U. S. Courthouse, Chicago 4, Illinois**

Send complete details and specifications of plant and site offered at once. (G-IND-415)

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Firm

Address

City Zone State

Don't junk your old planer just because it rumbles along like a freight train. Now is the time to have your outdated machine tools returned to their original performance levels through Simmons Engineered Rebuilding—at half the cost of new equipment.



Engineered Rebuilding by Simmons *unconditionally guarantees* that your machine tools will equal or exceed manufacturers' original specifications.

And, through modernization, Simmons is adapting old machines to high-speed, high-precision production that was unheard of when the tools were new.

Today: look into the important economies in production, maintenance, and liberal tax allowances available when you turn the old machines in your plant into precision equipment for today's production!

Write, wire, or phone...

Simmons Machine Tool Corp.

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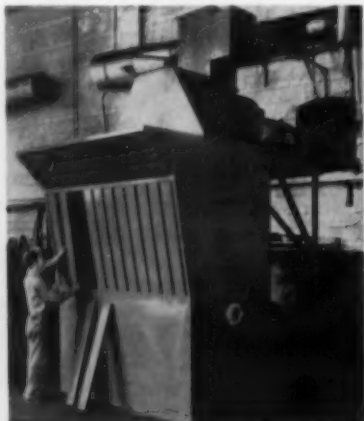
Unconditional guarantee...

our standard since 1910

NEW EQUIPMENT

Dust collector for foundry

This Centri-Merge packaged dust collector unit, designed especially for the foundry industry, is suitable for pouring and shakeout stations. It has a built-in reservoir that permits recycling of water so that only small quantities of make-up water are required. The fresh water fill manifold is equipped with

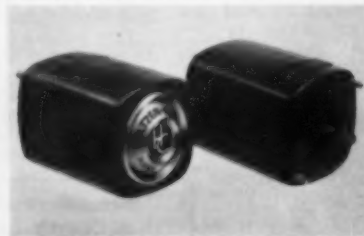


solenoid valve to insure economic operation at maximum efficiency. The attached adjustable hood is readily removable for cleaning and provides for entrapment of hazardous fumes and dust in such manner that it does not interfere with the overhead crane conveying work to and from the operator. *Schmieg Industries, Inc.*

For more data circle No. 41 on postcard, p. 121.

Subfractional motors

New subfractional motor in a 3-in. diam frame rounds out a line of subfractional motors for instrument, recording unit and office ap-



pliance applications. It constitutes an intermediate size between the 2½ and 3¾ in. frames. Majority of the motors are single-value capacitor type, for single-phase operation. These synchronous motors have stainless steel shafts and a new rotor construction. The class

STAMPINGS for the **FINISHED** **PRODUCT**



SEE SESSIONS... for Metal Specialties, Box & Case Hardware, Stamped Assemblies in a wide range of finishes.



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BOX 479 KNOXVILLE, TENNESSEE

is basically the reluctance type, but the rotor is cylindrical with no irregularities or slot opening. This promotes more uniform torque and quieter operation. *Holtzer-Cabot Motor Div.*

For more data circle No. 42 on postcard, p. 121.

Rubber-base cement

Flexibility that allows it to "give" instead of cracking under heavy loads is a characteristic of Latitec, a rubber-cement blend. This



new concrete-type industrial flooring and construction material also dampens shock and noise, resists alkalis and mild acids, is waterproof and has a non-slip quality. It is designed for use as a top surfacing material to repair damaged concrete floors or to repair cracks. A 1/4 in. layer, the suggested thickness, is said to support heavy loads such as fork lift trucks, when put down over a hard base. *Naugatuck Chemical Div., U. S. Rubber Co.*

For more data circle No. 43 on postcard, p. 121.

Reduces lapping time

A new centerless lapping machine operates as much as 25 pct faster than earlier models. Adjustment and spacing of the rollers is easier because a new fine adjustment locking device with special 6-in. scale permits the operator to set the rolls as he requires. Special hold-down lever requires less pressure to be applied to the workpiece. This eliminates need for lapping sticks, reduces operator fatigue and speeds up the palling operation. Needle bearings assure longer roller life and rolls can be dressed in place while the machine is operating in less than 5 min. No grinding is required. *Size Control Co.*

For more data circle No. 44 on postcard, p. 121.

Multiple-head grinder

A multiple-head semi-automatic abrasive grinder, Model 680, is designed for wet or dry grinding and polishing of ferrous, nonferrous, plastic and other materials. It has a maximum piece capacity of 4-in. high, 6-in. wide, any practical length. Speed of the conveyor belt, size 7-in. by 144-in., is easily adjustable for settings from 5 to 30 fpm. *Engelberg-Huller Co.*

For more data circle No. 45 on postcard, p. 121.

Checks cone angle

Miniature bench center checks cone angle. Set on sine table to desired angle of workpiece, this new precision bench center holds machined part within 0.0005 in. parallel to angle. Commercial tolerance gage slides along part, measures concentricity and deviations from cone angle. Bench center holds work up to 5 3/4 in. long and 3 1/4 in. diam, weighs 16 lb. *Transicoil Corp.*

For more data circle No. 46 on postcard, p. 121.

March 19-23

Coming!

8261 New Champions

of

TOOL-O-MATION*

The best and latest in *tools, machines, inspection equipment, automation devices, controls and accessories to cut costs and boost profits — many never before shown anywhere.

For the small plant
For the intermediate plant
For the big plant

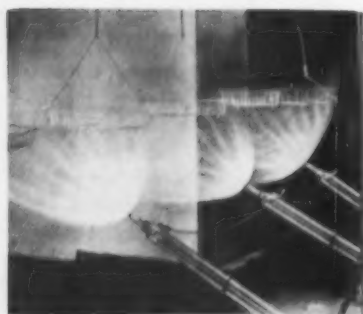
See them at ASTE's Greatest Show

Sponsored by the 32,000 men responsible for designing and selecting the best in production equipment. Write for advance registration blank today.

Equally important, plan to attend the 5-day, all-industry conference covering the latest developments in manufacturing techniques and equipment.

1956 ASTE INDUSTRIAL EXPOSITION
International Amphitheatre
CHICAGO, ILLINOIS
MARCH 19-23, 1956

AMERICAN SOCIETY OF TOOL ENGINEERS
10700 Puritan
Detroit 38, Michigan



Spray-coating plastisol on production line basis

A successful process for electrostatically spray-coating vinyl plastisols on fabricated wire baskets, dish drainer racks, display racks and other wire goods on a production-line basis is said to be twice as fast as dip coating. It eliminates plastisol wastage due to running, reduces intermittent handling, and is said to produce a superior coat-

ing in terms of uniformity and appearance. The entire operation is conveyorized; the actual spraying is automatic. The equipment used is an adaptation of Scientific Electric's standard line of ionic high potential spraying equipment. *United Chromium Div., Metal & Thermit Corp.*

For more data circle No. 47 on postcard, p. 121.

NEW



NO. 8 PRESS

FOR MORE
PRODUCTION AT
LOWER COSTS



The rigidity—versatility—accuracy of this new press enable it to produce more at lower costs. It provides a new concept of efficient press operation.

The air clutch is standard equipment on both geared and non-geared models. This provides easier and safer means for maximum practical speeds with shock-free, full-power operation. Alloy iron frame, long adjustable gibs, recessed crankshaft bearing caps, large air release—spring set brake and rugged ram adjusting screw with buttress thread and replaceable bronze seat are but a few of the features that will help to better your press operations.

Specifications

Capacity—90 tons. Standard Stroke—4". Maximum Stroke (to order)—8". Strokes per minute—40 (non-geared type 70). Throat Depth center of ram to frame—12½". Die Space—16½" to 24" (bed to ram, stroke down, adjustment up). Bolster Plate Area—38" x 24".



Write for Catalog—Fully describes all L & J O.B.I. Presses—21 geared and non-geared models. Capacities 8 to 90 tons. Also, 20 to 50 ton High Speed, Double Crank Straight Side Presses with speeds up to 450 s.p.m. Ask for Catalog L-12.

L & J Press Corporation, 1623 Sterling Ave., Elkhart, Ind.

4-channel bridge balance

Type 8-110 Bridge Balance is a general-purpose, four-channel control center for use in coupling strain gages or resistive-bridge-type pickups to direct-writing oscillographs, chart recorders, analog-to-digital converters, and standard meters. Coupled with high-sensitivity galvanometers in a multi-channel photographic recording oscillograph, the bridge balance permits direct recording without amplifiers. A wide variety of either static or dynamic measurements can be simultaneously recorded on the four data channels. *Consolidated Engineering Corp.*

For more data circle No. 48 on postcard, p. 121.

Strapping machine

An air-powered strapping machine that automatically tensions strapping and then seals and cuts it off in two easy motions is announced. The semi-automatic Model



AP tool is power driven, to reduce operator fatigue, and provides uniform, predetermined tension which may be easily adjusted to 1600 lb. For use with 5/8-in. or 3/4-in. Signode steel strapping, the machine has a magazine capacity of 75 seals. *Signode Steel Strapping Co.*

For more data circle No. 49 on postcard, p. 121.

NEW EQUIPMENT

Portable electric drill

A low-cost $\frac{3}{8}$ -in. electric drill is rugged and durable enough for light industrial use. Capacity of the Model 389 drill is $\frac{3}{8}$ -in. in steel



and $\frac{3}{4}$ -in. in wood. Free speed is 650 rpm. Voltage either 115 or 230, optional. Rating is 2.6 amps. Weight, 5-lb. Ball and bronze bearings, lightweight aluminum-alloy die cast housing. Drill has a geared chuck, trigger lock, and self-lubricating bearings. *Mall Tool Co.*

For more data circle No. 50 on postcard, p. 121.

Live and gravity rollers

As part of an integrated production line, this new conveyor combines live rollers on the straightaway with gravity rollers on merging sections. The 1-in. rollers are closely spaced to carry relatively small flat, stamped parts, and guard rails are used on the curves and straightaway. Curved sections are supported on steel legs which are adjustable vertically to give the desired pitch. Motor for driving the actuating belt on live roller is mounted out of the way and is equipped with a variable speed control. *Sage Equipment Co., Inc.*

For more data circle No. 51 on postcard, p. 121.



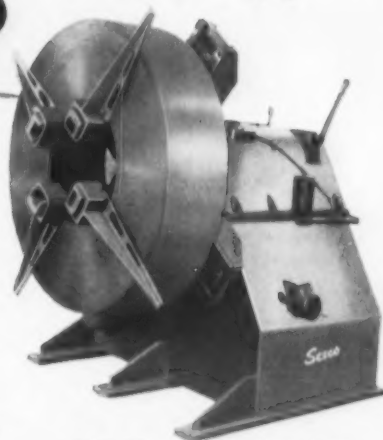
Sesco CENTERING REEL

A REEL THAT LEADS THE PARADE

- Completely Powered
- Simplified Loading
- No Adapters
- Floor Space Saver

The variation of inside and outside diameters of coils is a press room and handling problem;—

The Sesco Centering Reel is of rugged construction and designed to overcome this problem.



Data sheets available for gripper feeds, cradles, straighteners and reels.

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engineers & manufacturers
of machine tools and
press room equipment

SILENT HOIST KRANE KAR

"DOES JOB FASTER,
SAVES US ONE MAN,"
says Jim Gull, Supt. Equip't.,
Gull Contracting Co.,
New Lincoln Tunnel
Job, New York



Another
SILENT HOIST "First"
— FLUID DRIVE!

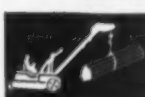
"We had a 20-ton crane on the job; now the KRANE KAR* does it faster and saves us one man. Works all over site as utility crane, 8 hrs. a day, 5 or 6 days a week. Handles beams, buckets, concrete and steel forms, lumber, cement, etc. Stores incoming materials and delivers them where needed. Loads, unloads trucks, and carries big loads up and down ramp. KRANE KAR is easy to operate; we have a half dozen men here who can run it. Doing a fine job for us," says Mr. Gull.

Write for illustrated Bulletin No. 79

*KRANE KAR Swing-Boom Mobile Crane available gas or diesel; adjustable telescopic boom; rubber tired; 5 sizes: 1½, 2½, 5, 10, 12½ ton cap.

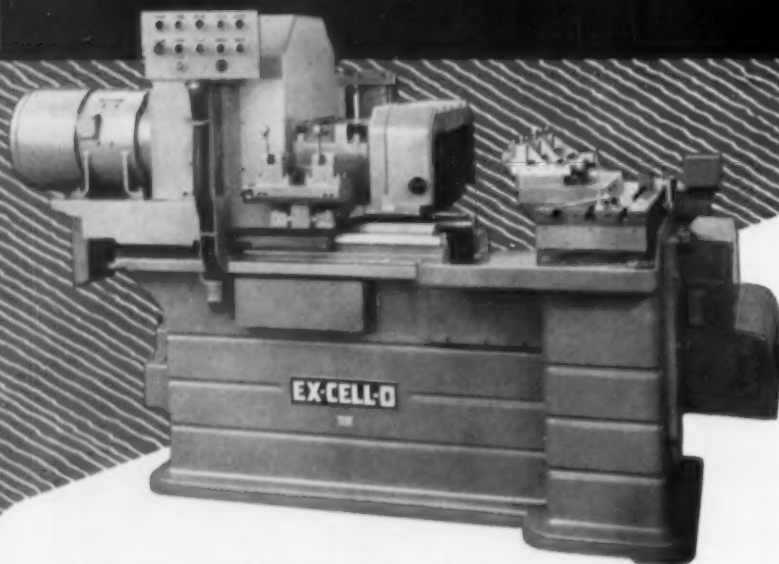
SILENT HOIST & CRANE CO.

Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
851 63rd Street, Brooklyn 20, N. Y.



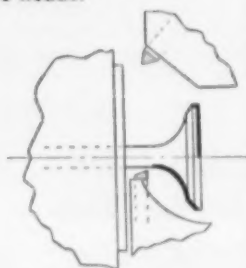
NEW EX-CELL-O MACHINE

contours valves by direct cam action (no levers)

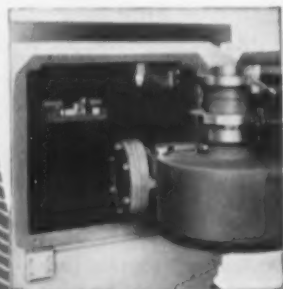
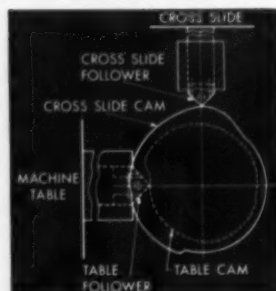


NEW EX-CELL-O CAM BORING MACHINE, Style 312, equipped with two spindles and tooling for operations on valve heads.

VALVES ARE CONTOURED, faced, turned, and taper-turned. This drawing shows the two tools used in each station. The paths they follow on the workpiece are indicated in heavy lines.



CONTOURING ACTION: Cams act directly on the slide—NO LEVERS. Separate cams for table and for cross slide are both on one shaft, giving exact co-ordination.



CAMS CHANGED IN MINUTES: Cam assembly swings out for quick change of operation. All motors are outside the base.



CHIPS, COOLANT CANNOT ENTER THE BASE. Large chip chute is cast integral with the solid top of the heavy nickel iron base.



55-1

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES • CUTTING TOOLS • RAILROAD PINS
AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

The Iron Age SUMMARY . . .

Steel producers are worrying about how to finance expansion . . . Some industry leaders are talking about need for higher prices . . . Market continues tight.

Whither Expansion Funds . . . Steel producers are worrying about where they'll get the money to finance much-needed expansion. Some are thinking in terms of higher prices to bolster earnings and attract more money from investors.

The problem is a tough one to solve. Expansion already is underway or in the planning stage. But some of it was predicated on continuation of the fast tax writeoff program. And the Government has closed the door to further rapid amortization for steel ingot expansion.

In recent years, steel price rises have been tied in with higher wages for steel labor. But there's no reason why prices could not move at any time, depending on the need for a better return on investment. With the domestic market about as tight as it's ever been, some steel people and industrial economists believe the economic picture would support higher prices.

Would Pay More . . . Even some consumers have expressed willingness to pay more for certain products if it would assure a continuing good supply as contrasted with intermittent shortages. Delivery is the important thing now.

Some of the problems plaguing both producers and consumers over the last six months

would not be so severe if there were more ingot capacity. In many cases, rolling mill capacity is available but there is not enough raw steel to keep them operating at top speed.

Meanwhile, steel procurement continues to be a serious problem for most consumers. Allocations have been cut to the bone in a desperate effort to bring deliveries into line with promises.

But the outlook for balance of the year promises a continuing scramble for tonnages necessary to keep production lines rolling. Prospects for any inventory buildup are black.

Catch Up Period . . . Some consumers have already been advised by their suppliers not to look for much if anything next January. This means that January or a succeeding month in first quarter '56 will be used by some mills to catch up with their backlogs.

Carryovers into the New Year will be heavy. None of the major consuming industries is going to ease the pressure for deliveries. Foremost among them is automotive, which is predicting another big year in '56. Incoming orders are running in excess of productive capacity.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week	Last Week	Month Ago	Year Ago
	2,341	2,341	2,316	1,749
Ingot Index (1947—1949=100)	145.5	145.5	144.0	109.0
Operating Rates				
Chicago	97.5	96.5	97.5	76.0
Pittsburgh	102.0	100.0*	97.0	71.0
Philadelphia	99.0	98.0*	98.0	62.0
Valley	99.0	95.0*	96.0	68.0
West	75.0	73.0*	93.0	84.0
Detroit	96.0	97.0	94.0	93.0
Buffalo	105.0	105.0	105.0	70.5
Cleveland	101.0	102.0	100.0	75.0
Birmingham	97.5	96.0	96.0	74.0
S. Ohio River	92.0	91.5*	87.0	82.0
Wheeling	101.0	101.0*	100.0	91.0
St. Louis	97.5	99.0	106.0	76.5
Northeast	89.0	95.5	96.0	49.0
Aggregate	97.0	97.0	96.0	72.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.174	5.174	5.174	4.798
Pig Iron (Gross Ton)	\$59.05	\$59.09	\$59.09	\$56.59
Scrap, No. 1 hvy (gross ton)	\$44.83	\$44.83	\$44.17	\$33.00
Nonferrous				
Aluminum ingot	24.40	24.40	24.40	22.20
Copper, electrolytic	43.00	43.00	43.00	30.00
Lead, St. Louis	15.30	15.30	14.80	14.80
Magnesium, ingot	33.25	33.25	33.25	27.75
Nickel, electrolytic	64.50	64.50	64.50	63.08
Tin, Straits, N. Y.	96.125	96.25	97.25	93.375
Zinc, E. St. Louis	13.00	13.00	13.00	11.50

Mills More Realistic In '56

Caution is the byword in first quarter of 1956 order acceptance . . . Mills vow to avoid overbooking . . . Customer will order less but get what he orders.

◆ **STEEL MILLS** are adopting a proceed-with-caution attitude in accepting orders for the first quarter of 1956. They are being very careful not to overbook as was the case this year when the market demand was far stronger than expected. As a result, customer relations deteriorated.

This, they vow, will not happen in 1956. What this means to you is that although you will not be able to order as much as you want, your chances of getting what you order are considerably better.

This more realistic approach is spurring mill scheduling departments to check and double check before making a delivery promise. Considering the fact that new orders must be coordinated with backlogs from the fourth quarter of 1955, there are any number of detours possible in this road of good intentions. However, the outlook for mill customer relations is much better than it has been.

One large midwestern producer has initiated a month-by-month system on a trial basis. If this doesn't do the job they are considering setting aside a "catch up month," probably March, for which they will accept no orders, in an attempt to fulfill their commitments.

Outlook for sheet and strip indicates no letup for about nine months, with orders running 15 to 20 pct above mill capacity.

Plate and structurals are equally as tight, with highest carryover of any product expected.

Bars are easier with mill delivery averaging 2 to 4 weeks. Shortest delivery time is for cold-finished bars.

Warehouses report mixed situations with the biggest pinch expected the beginning of 1956.

SHEETS AND STRIP . . . One major sheet consumer in **Chicago** says that he expects no improvement in sheet deliveries in the next six months at least. Mills generally agree with him but claim that they are only 4 to 6 weeks behind on HR and CR deliveries instead of the 8 as this consumer claims. The volume of carry-over plus the increased ordering for the first quarter of 1956 indicates continued allocations with no immediate relief. A big auto firm declares that while "inventory is less than we like" thus far production schedules have not been hurt. A slight easing is possible from this quarter for model changeover, but this would only be temporary.

BARS . . . In general bar deliveries and stock on hand do not seem to be worrying consumers to any extent. One major farm implement manufacturer reports bar delivery from the mill averages about 2 to 3 weeks. A major **Chicago** mill backs this up claiming their normal delivery schedule is now about 2 to 4 weeks. However in some sections orders are starting to pile up again. **Detroit** reports carbon bars became especially strong this week. At the warehouse level, one large firm claimed that his supplier told him to expect 50 pct of the allotment of carbon bars that he had been receiving, starting in January.

PLATES . . . Situation is basically the same in all sections. There is still no letup in demand. And mills are still not able to give customers any better service. Railroads and tank fabricators are trying to get all the plate they can. The big producers report deliveries are an average of 6 weeks in arrears with no relief in sight at least until the first of the year. Wider widths are slightly worse with a **Chicago** farm machinery manufacturer claiming a delay in shipments averaging 10 to 12 weeks.

STRUCTURALS . . . What can be said for plate can, in general, apply to structurals. **Chicago** reports a slightly tighter situation because of the prospect of several new office buildings to be built in the Loop District during 1956. The big play here is for wide flange but the smaller structurals are not far behind.

WIRE PRODUCTS . . . Merchant wire is still lagging behind manufacturing grades because of a normal lull during crop harvesting, but mills expect a pickup soon for barbed and regular fencing, for both after harvest and spring rebuilding. **Chicago** reports that wire mesh for roadbuilding programs is doing well, maintaining the pattern set as early as last spring. Autos and appliances are keeping manufacturing wire deliveries at about 6 weeks.

WAREHOUSES . . . The big gripe is still the lack of balance. However the delivery factor is not far behind. The warehouses are not pressuring the mills too heavily for delivery, but they'll take all they can get. **Detroit** reports business is most brisk for plate and structurals. Sheet is relatively quiet but the warehouses expect a rush anytime now. **Cleveland** customers are shopping around and according to reports there is very little demand for cut down products at a premium price.

STAINLESS . . . New source of stainless sheet at Republic's Massillon, O., mill officially unveiled this week adds first 48 in. wide stainless sheet from high production Sendzimir mill.

TUBULAR PRODUCTS . . . Smaller sizes are reported in good inventory supply at the warehouses with consumers getting delivery in 2 weeks. However both **Pittsburgh** and **Chicago** report first quarter of 1956 almost completely committed already for seamless and electricweld linepipe. Seasonal demand for oil country goods has slackened and drillers are in the process of informing the mills of their future requirements.

Purchasing Agent's Checklist:

METALS: What's the long-range outlook? p. 66

STEEL: Stainless holds big automotive market p. 67

MACHINE TOOLS: What's wrong with British machines p. 87

Comparison of Prices

(Effective Oct. 11, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *italics*.

	Oct. 11 1955	Oct. 4 1955	Sept. 13 1955	Oct. 12 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.325¢	4.325¢	4.325¢	4.05¢
Cold-rolled sheets	5.325	5.325	5.325	4.95
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.45
Hot-rolled strip	4.325	4.325	4.325	4.05
Cold-rolled strip	6.29	6.29	6.29	5.82
Plate	4.52	4.52	4.52	4.225
Plates wrought iron	9.30	9.30	9.30	9.30
Stainless C-R strip (No. 302)	44.50	44.50	44.50	41.50

Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$9.05	\$9.05	\$9.05	\$9.05
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.75
Special coated mfg. ternes	7.85	7.85	7.85	7.85

Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.312¢
Cold finished bars	5.90	5.90	5.90	5.45
Alloy bars	5.65	5.65	5.65	5.075
Structural shapes	4.60	4.60	4.60	4.25
Stainless bars (No. 302)	38.25	38.25	38.25	35.50
Wrought iron bars	10.40	10.40	10.40	10.40

Wire: (per pound)				
Bright wire	6.25¢	6.25¢	6.25¢	5.75¢

Rails: (per 100 lb.)				
Heavy rails	\$4.725	\$4.725	\$4.725	\$4.45
Light rails	5.65	5.65	5.65	5.35

Semifinish Steel: (per net ton)				
Revolving billets	\$68.50	\$68.50	\$68.50	\$64.00
Slabs, reolling	68.50	68.50	68.50	64.00
Forging billets	84.50	84.50	84.50	78.00
Alloy blooms, billets, slabs	96.00	96.00	96.00	86.00

Wire Rod and Skelp: (per pound)				
Wire rods	5.025¢	5.025¢	5.025¢	4.675¢
Skelp	4.225	4.225	4.225	3.90

Finished Steel Composite: (per pound)				
Base price	5.174¢	5.174¢	5.174¢	4.709¢

Finished Steel Composite
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	Oct. 11 1955	Oct. 4 1955	Sept. 13 1955	Oct. 12 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$68.69	\$68.69	\$68.69	\$61.19
Foundry, Valley	60.00	60.00	60.00	54.50
Foundry, Southern, Cin'ti	62.98	62.98	62.98	60.42
Foundry, Birmingham	58.00	58.00	58.00	52.58
Foundry, Chicago	59.00	59.00	59.00	56.50
Basic, del'd Philadelphia	62.77	62.77	62.77	60.87
Basic, Valley furnace	58.50	58.50	58.50	56.00
Malleable, Chicago	59.00	59.00	59.00	56.50
Malleable, Valley	59.00	59.00	59.00	56.50
Ferromanganese, cents per lb.	9.50¢	9.50¢	9.50¢	9.50¢
‡ 74-76 pct Mn base.				

Pig Iron Composite: (per gross ton)				
Pig iron	\$59.00	\$59.00	\$59.00	\$56.50

Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$44.50	\$44.50	\$44.50	\$34.50
No. 1 steel, Phila. area	46.50	46.50	46.50	30.00
No. 1 steel, Chicago	43.50	43.50	43.50	34.50
No. 1 bundles, Detroit	39.00	39.00	39.00	26.50
Low phos., Youngstown	49.00	47.50	47.50	35.50
No. 1 mach'y cast, Pittsburgh	45.50	46.50	45.50	42.50
No. 1 mach'y cast, Philadelphia	47.50	47.50	47.50	41.00
No. 1 mach'y cast, Chicago	53.50	53.50	52.50	43.50

Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	\$44.83	\$44.83	\$44.17	\$33.00

Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$13.25	\$13.25	\$13.25	\$14.30
Foundry coke, prompt	16.25	16.25	16.25	16.75

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	43.00	43.00	43.00	40.00
Copper, Lake Conn.	43.00	43.00	43.00	40.00
Tin, Straits, New York	96.125¢	96.25	97.25	93.375
Zinc, East St. Louis	13.00	13.00	13.00	11.50
Lead, St. Louis	16.30	16.30	16.30	14.50
Aluminum, virgin ingot	24.40	24.40	24.40	22.50
Nickel, electrolytic	64.50	64.50	64.50	60.00
Magnesium, ingot	32.25	32.25	32.25	27.75
Antimony, Laredo, Tex.	33.00	33.00	33.00	28.50
† Tentative. ‡ Average. * Revised.				

Steel Scrap Composite
Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

—To identify producers, see Key on P. 167—

Producing Point	Basic	Fdry.	Mall.	Beas.	Low Phos.
Bethlehem B3	60.50	61.00	61.50	62.00	
Birdsboro, Pa. B6	60.50	61.00	61.50	62.00	
Birmingham R3	54.50	55.00*	55.00	55.00	
Birmingham H9	54.50	55.00*	55.00	55.00	
Birmingham U4	54.50	55.00*	55.00	55.00	
Buffalo B3	58.50	59.00	59.50		
Buffalo H1	58.50	59.00	59.50		
Buffalo H6	58.50	59.00	59.50	60.00	
Chester C17	54.50	55.00	55.50		
Chicago I4	58.50	59.00	59.00	59.50	
Cleveland A5	58.50	59.00	59.00	59.50	63.50
Cleveland R3	58.50	59.00	59.00		
Duquesne L3	58.50	59.00	59.00		
Dunkirk I4	58.50	59.00	59.00	59.50	
Erie I4	58.50	59.00	59.00	59.50	
Everett M6		61.00	61.50		
Fontana K1	64.50	65.00			
Geneva, Utah C7	58.50	59.00			
Granite City G2	60.40	60.90	61.40		
Hubbard Y1		55.00	59.00		
Lane Star L3	60.50	61.00	61.50		
Minnequa C6	58.50				
Monessen P5	58.50				
Neville Is. P4	58.50	59.00	59.50		
N. Tenawanda T1	58.50	59.00	59.50		
Pittsburgh U1	58.50			59.50	
Sharpsville S1	58.50	59.00	59.00	59.50	
Sa. Chicago R3	58.50			59.00	
Steelton R3	60.50	61.00	61.50	62.00	66.50
Svealand A2	60.50	61.00	61.50	62.00	
Tolado I4	58.50	59.00	59.00	59.50	
Troy, N. Y. R3	60.50	61.00	61.50	62.00	66.50
Youngstown Y1				59.50	

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.50 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, 32¢ per ton for 0.5 to 0.75 pct nickel, \$1 for each additional, 0.25 pct nickel. *Add \$1.00 for 0.31-0.69 pct phos.
Silvery iron: Buffalo, H1, \$68.75; Jackson, J1, G1, \$67.50. Add \$1.00 per ton for each 0.50 pct silicon over base (0.31 to 0.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferroalloy prices are \$1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	301	302	303	304	316	321	348	416	418	430
Ingot, reolling	17.75	19.00	—	20.25	31.50	25.00	33.75	19.00	—	15.25
Slabs, billets, reolling	22.25	24.75	26.75	26.00	40.25	32.00	43.00	19.50	—	19.75
Forg. discs, die blocks, rings	—	—	—	—	—	—	—	—	—	—
Billets, forging	31.75	32.00	34.75	33.75	51.25	38.25	51.00	25.50	26.00	26.00
Bars, wires, structurals	38.00	38.25	41.00	40.25	60.75	45.25	60.00	30.50	31.00	31.00
Plates	40.00	40.25	42.75	43.00	64.00	49.25	64.75	31.75	32.00	32.25
Sheets	44.25	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75
Strip, hot-rolled	32.00	34.50	—	37.25	58.25	44.25	59.75	—	—	—
Strip, cold-rolled	41.00	44.50	—	47.25	68.25	54.25	73.00	36.25	—	36.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; McKeesport, Pa., U1; Washington, Pa., W2; J; Baltimore, El; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, J; Philadelphia, D3.

Strip: Midland, Pa., C11; Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leachburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton-Massillon, O., R3; Middletown, O., A7; Harrison, N. J., D3; Youngstown, C3; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (25¢ per lb higher); W1 (20¢ per lb higher); New Bedford, Mass., R6.

Bar: Baltimore, A7; Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., W2; McKeesport, Pa., U1; F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T5; Ft. Wayne, J4; Philadelphia, D3; Detroit, R5.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Cantonville, Pa., C15; Philadelphia, D3.

Forged discs, die blocks, rings: Pittsburgh, C11; Syracuse, C11; Ferndale, Mich., A3; Washington, Pa., J2.

Forgings billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R5.

Cleveland Prices Move Up

Youngstown, Cincinnati also show broad gains . . . No change in Pittsburgh, Philadelphia prices for No. 1 heavy melting . . . Composite holds at \$44.83.

♦ OHIO was the liveliest spot in a scrap market that was generally strong and steady.

Price of No. 1 heavy melting advanced \$1.50 in Cleveland, Youngstown and Cincinnati. Most other grades moved up in these areas. Scrap was reported moving out of Cleveland to Pittsburgh.

In the East, most buying continued on a weekly basis at going figures. The area showed fair activity but there is still no buildup of scrap either by dealers or the mills.

The Pittsburgh market remains quiet with activity in the best steel-making grades, practically at a standstill. Blast furnace grades moved up \$1. Cast and electric furnace grades showed scattered gains.

On the West Coast, all prices went up, with advances in No. 1 heavy melting running from \$2 to \$4.50.

THE IRON AGE Composite for No. 1 heavy melting steel remains \$44.83.

Stocks of ferrous scrap held by consumers on August 31 totaled 6,571,000 gross tons. This was a 3 pct increase over July stocks and the largest quantity on hand since last December.

Pittsburgh . . . Despite capacity operating rates openhearth scrap activity continues to drag. The market for No. 1 heavy melting is at a standstill with mills continuing to rely on secondary grades and industrial scrap to maintain production and at the same time keep a rein on the market. New sales of low phos scrap are reported up \$1 a ton to \$50 and No. 1 RR heavy melting and rails advanced \$1 on the basis of the latest RR lists. No. 1 machinery cast and cupola cast

advanced to \$49 and \$43 respectively. Blast furnace grades were up \$1 a ton on the latest transactions.

Chicago . . . Firm level of market activity is holding to the gains made in recent weeks. Broker and dealer activity continues strong and there has been some reported consumer buying at several dollars better than current listings on No. 2 heavy melting steel and No. 1 factory bundles. There seems to be some confusion on the part of some brokers and dealers as to whether recent gains made will be followed by more in the immediate days ahead.

Philadelphia . . . Market here continues strong and steady with most prices holding and a few advancing. Machine shop turnings, mixed borings and short turnings and cast iron borings moved up \$1. Rails 18 in. and under rose \$1. Clean cast chemical borings took a big jump when a Jersey consumer came into the market after a month's inactivity. Steelmaking grades continue to move at a fair rate on weekly orders to local mills. Mills are paying going prices to get scrap but, like the yards, are avoiding any real buildup.

New York . . . This market is getting ready to jump. Brokers so far have been able to cover their commitments and resist pressure from dealers for higher prices. But dealer sentiment is strong that the next 30 days will bring higher prices, particularly as winter hampers collections. All prices are unchanged in a strong market.

Detroit . . . No new activity was reported in the scrap market this week. Dealers and brokers are still filling orders placed at the beginning of the month. Market observers be-

lieve that the present firm tone will be maintained here at least through November, and they expect business to pick up here when the water shipping season ends.

Cleveland . . . Valley price rose \$1.50 on recent sales of dealer scrap and Cleveland price went up in sympathy. Activity was generally slow in Cleveland with major consumer still staying out of market with substantial inventories of light material on hand and all blast furnaces in operation. Substantial tonnage of prime grades from restricted yards reported going from Cleveland to Pittsburgh at over \$5 freight bills for delivery there at about \$50. Cleveland foundry business good.

Birmingham . . . An Atlanta steel mill that last week announced increased prices for both local and distant scrap has raised its price for local scrap another \$2 to \$38 a ton over its previous order. The largest buyer in the district—usually a price setter—is still out of the market.

St. Louis . . . Steel mills in the St. Louis industrial district increased their buying prices \$2 a ton on No. 1 and No. 2 heavy melting steel and No. 2 bundles to put this market in line with Chicago and Kansas City prices. No. 1 bundles are up \$1 ton on outside buying.

Cincinnati . . . Local mill made small purchase of No. 1 scrap with substantial portion coming in from out of town at competitive prices. Purchase price was \$1.50 over previous month. Fringe area mill also buying neighboring factory bundles at \$44.

Buffalo . . . Prices remain unchanged in a quiet market here. Some dealers say changes may come at the end of the month. Steel operations continue at high rate.

Boston . . . Prices hold as market continues on the quiet side here. Eastern Pennsylvania mills are doing some buying. Pittsburgh consumers remain out of the market. Cast grades showed good strength.

West Coast . . . Mills in Seattle, San Francisco, and Los Angeles boosted prices \$2 to \$4 per ton on most grades. Although mills have comfortable supplies on hand, they don't want to take chances on having to eat deeply into inventory. Unslowed by price hike, heavy exporting continues.

GREAT MOMENTS IN THE HISTORY OF IRON AND STEEL MAKING



Joseph Hall



A water-powered trip hammer forging a bloom started in the puddling furnace shown in the background. This is the tenth in a series of outstanding inventions and developments that have contributed to the progress of the iron and steel industry.

1830 Pig Boiling

Of the early developments in iron and steel production the puddling process has stood the test of time.

First conceived by Henry Cort as the "dry puddling" process and later modified by Joseph

Hall's "pig boiling" process, it has remained essentially the same for a century and a half.

Hall's improvement was to eliminate the waste of iron, which at times ran as high as 30 per cent of the charge. He did this by substituting air cooled cast iron bottoms for the sand hearth lining and shortened the time of heat.

The key operational point in wrought iron manufacture is the pouring of molten refined iron into a bath of liquid slag to form a sponge-like ball of iron impregnated with liquid slag. This refined iron is defined as iron bars rolled from a box pile of muck bars and wrought iron scrap bars free from steel.

The extreme selectivity of a charge points up the importance of scrap of known analysis, a problem particularly suited to our experience, personnel, equipment and the strategic location of our offices. Possibly our facilities may help you solve a problem in iron or steel scrap.

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EXPORTS-IMPORTS **LIVINGSTON & SOUTHARD, INC.** 99 Park Ave., New York, N. Y. Cable Address: **FORENTRACO**

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Scrap Prices (Effective Oct. 11, 1955)

Pittsburgh

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	30.00 to 31.00
Mixed bor. and ms. turn.	30.00 to 31.00
Shoveling turnings	33.00 to 34.00
Cast iron borings	33.00 to 34.00
Low phos. punch'gs, plate	49.00 to 50.00
Heavy turnings	
No. 1 RR. hvy. melting	45.00 to 46.00
Scrap rails, random lgth.	45.00 to 46.00
Rails 3 ft and under	44.00 to 45.00
RR. steel wheels	52.50 to 53.50
RR. spring steel	52.50 to 53.50
RR. couplers and knuckles	52.50 to 53.50
No. 1 machinery cast.	48.00 to 49.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	38.00 to 39.00

Chicago

No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 factory bundles	45.00 to 46.00
No. 1 dealers' bundles	42.00 to 43.00
No. 2 dealers' bundles	38.00 to 39.00
Machine shop turn.	30.00 to 31.00
Mixed bor. and turn.	31.00 to 32.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	31.00 to 32.00
Low phos. forge crops	53.00 to 54.00
Low phos. punch'gs, plate	50.00 to 51.00
Low phos. 3 ft and under	49.00 to 50.00
No. 1 RR. hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	45.00 to 46.00
Rolling rails	65.00 to 67.00
Rails 3 ft and under	42.00 to 43.00
Locomotive tires, cut	52.00 to 53.00
Cut boilers & side frames	54.00 to 55.00
Angles and splice bars	58.00 to 59.00
RR. steel car axles	56.00 to 57.00
RR. couplers and knuckles	52.00 to 53.00
No. 1 machinery cast.	53.00 to 54.00
Cupola cast.	48.00 to 49.00
Heavy breakable cast.	41.00 to 42.00
Cast iron brake shoes	39.00 to 40.00
Cast iron car wheels	45.00 to 46.00
Malleable	58.00 to 59.00
Stove plate	40.00 to 41.00

Philadelphia Area

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	28.50 to 29.50
Mixed bor. and turn.	28.50 to 29.50
Cast iron borings	28.50 to 29.50
Shoveling turnings	30.00 to 31.00
Clean cast chem. borings	35.00 to 36.00
Low phos. 3 ft and under	48.00 to 49.00
Low phos. punch'gs	49.00 to 50.00
Elec. furnace bundles	47.00 to 48.00
Heat. turnings	48.00 to 49.00
RR. steel wheels	50.00 to 51.00
RR. spring steel	50.00 to 51.00
Rails 18 in. and under	58.00 to 59.00
Cupola cast	41.00 to 42.00
Heavy breakable cast.	40.00 to 41.00
Cast iron car wheels	51.00 to 52.00
Malleable	57.00 to 58.00
Unstripped motor blocks	39.00 to 40.00
No. 1 machinery cast.	47.00 to 48.00

Cleveland

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	36.00 to 37.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	35.00 to 36.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Cut struct'l & plate, 3 ft & under	48.00 to 49.00
Drop forge flashings	43.00 to 44.00
Low phos. punch'gs, plate	44.00 to 45.00
Foundry steel, 3 ft & under	47.50 to 48.50
No. 1 RR. heavy melting	48.50 to 49.50
Rails 2 ft and under	57.00 to 58.00
Rails 18 in. and under	55.00 to 56.00
Railroad grate bars	37.00 to 38.00
Steel axle turnings	30.00 to 31.00
Railroad cast.	49.00 to 50.00
No. 1 machinery cast.	49.00 to 50.00
Stove plate	45.00 to 46.00
Malleable	51.00 to 52.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	\$47.50 to \$48.50
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	47.50 to 48.50
No. 2 bundles	37.00 to 38.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Low phos. plate	48.50 to 49.50

Buffalo

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 busheling	39.00 to 40.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	45.00 to 46.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 3 ft and under	52.00 to 53.00
RR. steel wheels	48.00 to 49.00
RR. spring steel	48.00 to 49.00
RR. couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	40.00 to 41.00

Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$38.50 to \$39.50
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles, openhearth	38.50 to 39.50
No. 2 bundles	27.00 to 28.00
New busheling	38.50 to 39.50
Drop forge flashings	38.00 to 39.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. punch'gs, plate	38.50 to 39.50
No. 1 cupola cast.	31.50 to 32.50
Heavy breakable cast.	34.00 to 35.00
Stove plate	35.00 to 36.00
Automotive cast.	42.00 to 44.00

St. Louis

No. 1 hvy. melting	\$38.50 to \$39.50
No. 2 hvy. melting	36.00 to 37.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	31.50 to 32.50
Machine shop turn.	27.00 to 28.00
Cast iron borings	28.00 to 29.00
Shoveling turnings	28.00 to 29.00
No. 1 RR. hvy. melting	46.00 to 47.00
Rails, random lengths	53.00 to 54.00
Rails, 18 in. and under	59.00 to 60.00
Locomotive tires uncut	59.00 to 60.00
Angles and splice bars	50.00 to 51.00
Std. steel car axles	49.00 to 50.00
RR. specialties	50.00 to 51.00
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	35.00 to 36.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	38.00 to 39.00
Cast iron car wheels	47.00 to 48.00
Malleable	48.00 to 49.00
Unstripped motor blocks	37.00 to 38.00

Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$35.50 to \$36.50
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	35.50 to 36.50
No. 2 bundles	26.00 to 27.00
No. 1 busheling	35.50 to 36.50
Elec. furnace, 3 ft & under	37.50 to 38.50
Machine shop turn.	18.00 to 19.00
Mixed bor. and short turn.	20.50 to 21.50
Shoveling turnings	23.00 to 24.00
Clean cast chem. borings	18.00 to 19.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	28.00 to 29.00
Unstripped motor blocks	17.00 to 18.00

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$40.50 to \$41.50
No. 2 hvy. melting	35.00 to 36.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	22.00 to 23.00
Clean cast chem. borings	24.00 to 25.00
No. 1 machinery cast.	27.00 to 28.00
Mixed yard cast.	36.00 to 37.00
Charging box cast.	37.00 to 38.00
Heavy breakable cast.	37.00 to 38.00
Unstripped motor blocks	24.00 to 25.00

Birmingham

No. 1 hvy. melting	\$36.00 to \$38.00
No. 2 hvy. melting	32.00 to 34.00
No. 1 bundles	36.00 to 38.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	36.00 to 38.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	17.00 to 18.00
Electric furnace bundles	38.00 to 39.00
Bar crops and plate	43.00 to 44.00
Structural and plate, 2 ft.	42.00 to 43.00
No. 1 RR. hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	52.00 to 53.00
Rails, 18 in. and under	58.00 to 59.00
Angles & splice bars	53.00 to 54.00
Rolling rails	57.00 to 58.00
No. 1 cupola cast.	47.50 to 48.50
Stove plate	44.50 to 45.50
Charging box cast.	30.00 to 31.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	36.00 to 37.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	35.50 to 36.50
No. 1 bundles	42.00 to 43.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	28.50 to 29.50
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	31.50 to 32.50
Cast iron borings	25.00 to 26.00
Low phos. 18 in. & under	50.00 to 51.00
Rails, random lengths	53.00 to 54.00
Rails, 18 in. and under	60.00 to 61.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	41.00 to 42.00
Drop broken cast.	50.00 to 51.00

San Francisco

No. 1 hvy. melting	\$37.00
No. 2 hvy. melting	35.00
No. 1 bundles	37.00
No. 2 bundles	32.00
No. 3 bundles	28.00
Machine shop turn.	18.00
Cast iron borings	11.00
No. 1 RR. hvy. melting	37.00
No. 1 cupola cast.	45.00

Los Angeles

No. 1 hvy. melting	\$35.00
No. 2 hvy. melting	33.00
No. 1 bundles	35.00
No. 2 bundles	30.00
No. 3 bundles	26.00
Machine shop turn.	14.00
Shoveling turnings	17.00
Cast iron borings	14.00
Elec. furn. 1 ft and under	35.00
No. 1 RR. hvy. melting	35.00
No. 1 cupola cast.	45.00

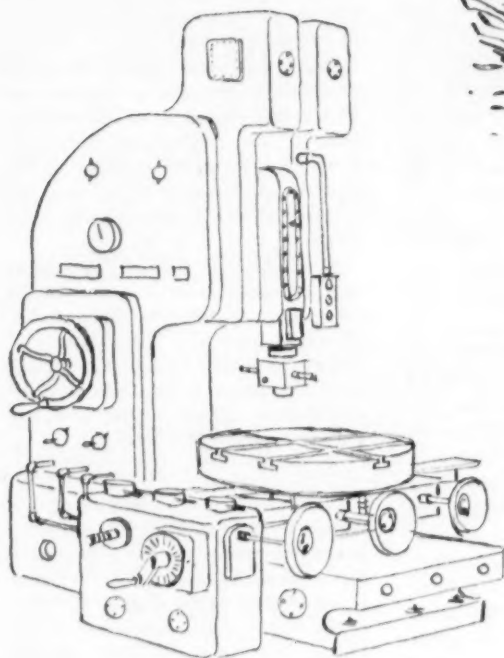
Seattle

No. 1 hvy. melting	\$39.50
No. 2 hvy. melting	35.50
No. 3 bundles	30.50
No. 2 bundles	26.50
No. 1 cupola cast.	40.00
Mixed yard cast.	40.00

Hamilton, Ont.

No. 1 hvy. melting	\$38.50
No. 2 hvy. melting	35.50
No. 1 bundles	38.50
No. 2 bundles	32.50
Mixed steel scrap	32.50
Bushelings	33.50
Bush., new fact. prep'd	36.50
Machine shop turn.	32.50
Short steel turn.	25.50
Mixed bor. and turn.	\$16.00 to 17.00
Rails, rerolling	47.50
Cast scrap	42.00 to 45.00

dawn of automation



Some time during the beginning of civilization came the potter's wheel, ancestor of the machine tool. But modern development came in 1840 when Sir Joseph Whitworth, the English inventor, succeeded in producing plane surfaces with a very high degree of precision—an achievement that formed the groundwork for many other of his developments in machine tools—and of importance in establishing machine shop practice.

Today, countless hand tools, machine tools, and the tools of automation depend upon iron and steel as indispensable ingredients.

For these and the thousands of other demands on the industry's facilities, a flow of scrap to the mills must be continuously maintained.

For the purchase or sale of iron or steel scrap . . .

phone or write "Your Chicago Broker"



231 S. La Salle St., Chicago

Telephone ANdover 3-3900

Copper Smelters Cut Price

Triple drop heralds beginning of possible leveling off . . . London price down . . . Consumer resistance key factor.

◆ **TOBOGGANING** copper price quotations by custom smelters for both metal and scrap stole the nonferrous show last week. Sparked by breaks in the London market, domestic custom smelters reduced prices of their product a total of 4.50 cents per lb in three successive drops. At presstime custom smelters had cut prices back to 45.50 cents per lb, and many market sources were predicting more price slashes were yet to come.

Some talked as if a price of 43 cents at the current producers' level was assured in the near future.

Several factors contributed to the staccato drops. Certainly of major significance were consumer price resistance, both domestic and European; easing of labor troubles at Chilean mines; and revival of that perennial song, "we're finding substitutes for copper," by important users.

Chile

Chile's strategy in recent months has been obvious: the government has been giving the lion's share of exports to Europe to force the U. S. price up. But even when labor troubles tightened the supply more than usual, nobody would play. For example, London copper users lived from hand to

mouth, with inventories deliberately sparse. And not very subtle hints by American consumers about aluminum electrical wire, transformers and the like has certainly had its effect. Add to this the temporary knockout of an important segment of the nation's copper and brass industry by the New England floods, making things even harder for copper users, and the price situation becomes more understandable.

Europe

But, and it's an important but, it could be a bad mistake to assume that copper prices have leveled off yet. High production and high metal needs continue to be the rule rather than the exception, both in this country and in Europe. Talk of substitutes is all very well, and is becoming increasingly feasible in many applications. But copper has its important place in American industry because of performance. There are still many instances where no substitution is possible. Demand will stay strong for a long time.

In Europe, the situation is even more complex. Substitutes are not feasible, because any substitutes would be just as scarce. European industry is enjoying a prolonged period of post-war prosperity and production. But it is plagued by a

continuing shortage of all metals, not just copper. The worldwide demand for copper looks like it will continue to keep the pressure on prices for a long time to come.

ALUMINUM . . . Demand for aluminum continues at peak levels. Production, running a better than six pct above last year, is having a hard time keeping up with customers' demands. Shipments are running 36 pct over the 1954 level.

Aluminum Association reported last week that shipments in August were 118,276 tons, an increase of 13,685 tons over July. Total shipments for the first eight months of 1955 now stand at 934,763 tons; primary production for the period totaled 1,026,085 tons.

Sheet and plate demand continues to grow. Shipments for August ran 65,052 tons for an 8 months total of 460,491 tons. Castings shipments were off during the month, but the year-to-date figure is 62,926 tons, an increase of 13,400 tons over the same period in 1954.

Aluminum foil, statistically a small part of the industry, is one of its best salesmen. Recent demand has shown an unusually sharp rise, with shipments of 9000 tons in August and total shipments so far this year of 66,000 tons against 46,800 tons for the same period last year.

ZINC . . . Slab zinc smelter output dipped in September to 83,437 tons from the revised August figure of 84,862 tons, American Zinc Institute reported this week. Stocks on hand at the end of last month also dropped 42,167 tons compared with 46,084 tons at the end of August.

TIN . . . The rate at which the U. S. is importing tin from the world's principal source, Malaya, remains just about as constant as the price of the metal in this country. In 1954 the value of the metal imported was \$84.3 million, an average per month of \$7.02 million. For the first half of 1955, \$45.5 million worth of Malayan tin was brought into this country with a monthly average of \$7.6 million, higher as is the price. The significant fact is that although the 31,541 long tons total tin imported for the first half of this year was 5 pct below the total for the same period in 1954, the dependency on Malaya increased about 11 pct—23,014 long tons.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Oct. 5	Oct. 6	Oct. 7	Oct. 8	Oct. 10	Oct. 11
Copper, electro, Conn.	43.00	43.00	43.00	43.00	43.00
Copper, Lake, delivered	43.00	43.00	43.00	43.00	43.00
Tin, Straits, New York	96.25	96.00	96.125	96.25	96.25	96.125*
Zinc, East St. Louis	13.00	13.00	13.00	13.00	13.00	13.00
Lead, St. Louis	15.30	15.30	15.30	15.30	15.30	15.30

Note: Quotations are going prices

*Tentative

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
(“F” temper except 6061-0)

Alloy	.032	.081	.136- .249	.250- 3.
1100, 3003....	40.8	38.7	37.5	36.5
5052.....	48.3	43.4	41.7	39.9
6061-0.....	45.4	41.2	39.4	39.3

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-F8.....	41.5-43.3	56.6-60.2
12-14.....	42.3-43.7	57.5-61.8
24-26.....	45.3-45.7	67.7-72.1
36-38.....	53.6-54.2	90.5-94.3

Screw Machine Stock—2011-T-3

Size*	3/4	1/2-3/4	3/4-1	1 1/4-1 3/4
Price	54.5	53.4	52.1	50.1

Roofing Sheet, Corrugated
(Per sheet, 26" wide, base, 16,000 lb)

Length "L"	72	96	120	144
.019 gage.....	\$1.295	\$1.727	\$2.160	\$2.590
.024 gage.....	1.615	2.162	2.692	3.232

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: F81-O 1/4 in., 61¢; 3/16 in., 62¢; 1/8 in., 61¢; 0.064 in., 75¢; 0.032 in., 90¢. Specification grade higher. Base, 30,000 lb.

Extruded Round Rod: F8, diam 1/4 to 3/16 in., 82.5¢; 1/2 to 3/8 in., 65¢; 1 1/4 to 1.749 in., 60.5¢; 2 1/2 to 3 in., 57¢. Other alloys higher. Base up to 1/2 diam, 10,000 lb; 3/4 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: F8. In weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 8.5 in., 70.7¢; 0.22 to 0.25 lb, 6.9 in., 66.9¢; 0.50 to 0.59 lb, 5.6 in., 63¢; 1.8 to 2.59 lb, 19.5 in., 60.8¢; 4 to 6 lb, 28 in., 57.7¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb; 1/2 to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: F8, 0.049 to 0.057 in. wall thickness: OD 1/4 to 5/16 in., \$1.625; 5/16 to 3/8 in., \$1.475; 3/8 to 1/2 in., \$1.105; 1 to 2 in., \$2.5¢; 3.165 to 9.219 in. wall: OD, 1/2 to 1 in., 75.5¢; 1 to 2 in., 71.5¢; 3 to 4 in., 70.5¢. Other alloys higher. Base OD: Up to 1 1/2 in., 10,000 lb; 1 1/2 to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper.....	56.79	55.86	55.86
Copper, h-r.....	58.76	55.11	55.11
Copper, drawn.....	56.36	55.36	55.36
Low brass.....	53.15	52.09	52.09
Yellow brass.....	49.27	49.21	49.21
Red brass.....	54.54	54.48	54.48
Naval brass.....	52.83	47.14	48.40
Lead brass.....	52.83	47.14	48.40
Com. bronze.....	54.48	54.48	54.48
Mang. bronze.....	56.57	56.67	52.23
Phos. bronze.....	77.14	77.64	77.64
Muntz metal.....	50.94	48.75	48.00
Ni silver, 10 pct.....	63.05	64.13	68.50
Beryllium copper, CR, 1.9% Be, Base			
2000 lb, f.o.b.			
Strip.....			\$1.84
Rod, bar, wire.....			1.81

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel Monel	Inconel
Sheet, CR.....	102	78
Strip, CR.....	102	87
Rod, Bar, HR.....	87	69
Angles, HR.....	87	69
Plate, HR.....	97	82
Seamless Tube.....	122	105
Shot, Blocks.....		85

Titanium

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, \$14.00-\$14.50; alloy \$16.50; Plate, HR, commercially pure, \$11.50-\$12.00; alloy, \$12.50-\$12.75; Wire, rolled and/or drawn, commercially pure, \$10.50-\$11.00; alloy, \$12.50; Bar, HR or forged, commercially pure, \$8.50-\$8.75; alloy, \$8.50-\$9.00.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99.99%, 10,000 lb, freight allowed.....	24.40
Aluminum pig.....	23.50
Antimony, American, Laredo, Tex.....	33.50
Beryllium copper, per lb cont'd Be.....	\$43.00
Beryllium aluminum 5% Be, Dollars	
per lb contained Be.....	\$72.75
Bismuth, ton lots.....	\$2.25
Cadmium, del'd.....	\$1.70
Cobalt, 97-99% (per lb).....	\$2.60 to \$2.67
Copper, electro, Conn. Valley.....	43.00
Copper, Lake, delivered.....	43.00
Gold, U. S. Treas., per troy oz.....	\$35.00
Iridium, 99.9%, dollars per troy oz.....	\$2.25
Iridium, dollars per troy oz.....	\$100 to \$120
Lead, St. Louis.....	15.30
Lead, New York.....	15.50
Magnesium, 99.84%, f.o.b. Freeport, Tex., 10,000 lb, pig.....	32.50
ingot.....	33.25
Magnesium, sticks, 100 to 500 lb.....	53.00
Mercury, dollars per 76-lb flask, f.o.b. New York.....	\$274 to \$278
Nickel electro.....	64.50
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel.....	60.75
Palladium, dollars per troy oz.....	\$22 to \$24
Platinum, dollars per troy oz.....	\$91 to \$95
Silver, New York, cents per troy oz.....	\$1.875
Tin, New York.....	96.125
Titanium, sponge, grade A-1.....	\$3.95
Zinc, East St. Louis.....	13.00
Zinc, New York.....	13.50
Zirconium, sponge.....	\$7.50 to \$10.00

REMELED METALS**Brass Ingot**

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115.....	42.50
No. 120.....	42.00
No. 123.....	41.50
80-10-10 ingot	
No. 305.....	45.75
No. 315.....	44.00
88-10-2 ingot	
No. 210.....	59.25
No. 215.....	55.25
No. 245.....	48.75
Yellow ingot	
No. 405.....	34.75
Manganese bronze	
No. 421.....	38.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.....	31.25-32.50
0.60 copper max.....	31.00-32.25
Piston alloys (No. 122 type).....	31.00-32.25
No. 12 alum. (No. 2 grade).....	30.00-31.00
108 alloy.....	31.25-32.00
195 alloy.....	31.25-32.00
13 alloy (0.60 copper max).....	31.50-32.75
AXB-679.....	30.00-31.00

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97 1/2%.....	30.50-31.50
Grade 2—92-95%.....	29.50-30.50
Grade 3—90-92%.....	28.50-29.50
Grade 4—85-90%.....	28.00-29.00

SCRAP METALS**Brass Mill Scrap**

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	39	38 1/2
Yellow brass.....	38 1/2	36 1/2
Red brass.....	34 1/2	33 1/2
Comm. bronze.....	34 1/2	35
Mang. bronze.....	26 1/2	25 1/2
Yellow brass rod ends.....	28 1/2	

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	39
No. 2 copper wire.....	37 1/2
Light copper.....	35 1/2
*Refinery brass.....	35 1/2
*Dry copper content.	

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	39
No. 2 copper wire.....	37 1/2
Light copper.....	35 1/2
No. 1 composition.....	31 1/2
No. 1 comp. turnings.....	31 1/2
Roller brass.....	25
Brass pipe.....	25
Radiators.....	25 1/2
Aluminum	
Mixed old cast.....	20 —21
Mixed new clips.....	21 —22
Mixed turnings, dry.....	20 —21 1/2

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire.....	35 1/2—36
No. 2 heavy copper and wire.....	34 —34 1/2
Light copper.....	31 1/2—32
New type shell cuttings.....	31 1/2—32
Auto radiators (unswaged).....	23 1/2—24
No. 1 composition.....	29 1/2—30 1/2
No. 1 composition turnings.....	28 1/2—29 1/2
Unlined red car boxes.....	23 1/2—24
Cocks and faucets.....	24 —24 1/2
Mixed heavy yellow brass.....	21 1/2—22
Old rolled brass.....	22 1/2—23
Brass pipe.....	24 1/2—25
New soft brass clippings.....	25 —25 1/2
No. 1 brass rod turnings.....	23 —23 1/2

Aluminum

Alum. pistons and struts.....	17 —17 1/2
Aluminum crankcases.....	17 —17 1/2
1100 (28) aluminum clippings.....	19 —19 1/2
Old sheet and utensils.....	17 —17 1/2
Borings and turnings.....	10 1/2 —11
Misc. cast aluminum.....	17 —17 1/2
2024 (24s) clippings.....	18 —18 1/2

Zinc

New zinc clippings.....	8 —8 1/2
Old zinc.....	5 1/2 —6
Zinc routings.....	3 1/2 —4
Old die cast scrap.....	3 1/2 —4

Nickel and Monel

Pure nickel clippings.....	90 —92
Clean nickel turnings.....	75
Nickel anodes.....	90 —92
Nickel rod ends.....	90 —92
New Monel clippings.....	60
Clean Monel turnings.....	44
Old sheet Monel.....	50
Nickel silver clippings, mixed.....	18 1/2—19
Nickel silver turnings, mixed.....	19

Lead

Soft scrap lead.....	12 1/2—12 3/4
Battery plates (dry).....	6 1/2 —6 3/4
Batteries, acid free.....	4 1/2

Magnesium

Segregated solids.....	18 1/2—19
Castings.....	17 1/2—18

Miscellaneous

Block tin.....	80 —81
No. 1 pewter.....	63 —64
Auto babbitt.....	42 —43
Mixed common babbitt.....	14 1/2
Solder joints.....	19 1/2—20
Siphon tops.....	43
Small foundry type.....	16 1/2
Monotype.....	16
Lino. and stereotype.....	14 —14 1/2
Electrotype.....	12 —12 1/2
Hand picked type shells.....	10 1/2—11
Lino. and stereo. dross.....	6
Electro dross.....	6

IRON AGE

STEEL
PRICES(Effective
Oct. 11, 1956)

Italics identify producers listed in key at end of table. Base prices, f.a.b. mill, in cents per lb., unless otherwise noted. Extras apply.

	BILLETS, BLOOMS, SLABS			PIL- ING	SHAPES STRUCTURALS			STRIP					
	Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.		\$96.00 B3		4.65 B3	6.80 B3	4.65 B3						
	Buffalo, N. Y.	\$68.50 B3	\$84.50 R3, B3	\$96.00 R3, B3	5.45 B3	4.65 B3	6.80 B3	4.65 B3	4.325 R3,B3 4.25 R3, 4.25 R7,S10	6.425 B3	9.10 B3		
	Claymont, Del.												
	Harrison, N. J.												13.45 C11
	Conshohocken, Pa.							4.375 A2	6.30 A2	6.425 A2			
	New Bedford, Mass.								6.70 R6				
	Johnstown, Pa.	\$68.50 B3	\$84.50 B3	\$96.00 B3		4.65 B3	6.80 B3						
	Boston, Mass.								6.80 T8				13.90 T8
	New Haven, Conn.								6.70 D1 7.00 A5				
	Phoenixville, Pa.				5.15 P2		5.15 P2						
	Sparrows Pt., Md.							4.325 B3	6.25 B3	6.425 B3	9.10 B3		
	Bridgeport, Wallingford, Conn.	\$73.50 N8	\$89.50 N8					4.625 N8	6.70 W1			7.50 N8	
MIDDLE WEST	Fairbank, R. I. Worcester, Mass.								6.80 N7 7.10 A5				A5 13.80 N7
	Alton, Ill.							4.50 L1					
	Ashland, Ky.							4.325 A7					
	Canton-Massillon, Deer, Ohio		\$86.50 R3	\$96.00 R3									13.45 G4
	Chicago, Ill.	\$68.50 U1	\$84.50 R3, U1,W8	\$96.00 R3, U1,W8	5.45 U1	4.60 U1, W8	6.75 U1, Y1	4.60 U1	4.325 A1, N4,W8	6.35 A1,T8		7.20 W8	13.45 T8
	Cleveland, Ohio									6.25 A5,J3	9.30 A5		13.45 A5
	Detroit, Mich.			\$96.00 R5				4.425 G3,M2	6.35 D1,D2, G3,M2,P11	6.525 G3	9.20 D2, G3		
	Duluth, Minn.												
	Gary, Ind. Harbor, Indiana	\$68.50 U1	\$84.50 U1	\$96.00 U1, Y1	5.45 J3	4.60 U1, J3	6.75 U1, J3	4.325 J3, U1,Y1	6.35 J3 6.25 Y1	6.425 J3, U1,Y1	9.30 Y1	7.20 Y1, U1	
	Sterling, Ill.							4.425 N4					
	Indianapolis, Ind.								6.40 C5				
	Newport, Ky.											7.20 N5	
WEST	Middletown, Ohio								6.45 A7				
	Niles, Warren, Ohio Sharon, Pa.	\$68.50 C10	\$84.50 C10	\$96.00 C10				4.325 S1, R3	6.25 S1, R3,T4	6.425 S1, R3	9.10 S1, R3	7.20 S1	13.45 S1
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$68.50 U1, J3	\$84.50 J3, U1,C11	\$96.00 U1, C11	5.45 U1	4.60 U1, J3	6.75 U1, J3	4.325 P6	6.25 S7,B4			7.20 S9	13.45 S9
	Portsmouth, Ohio							4.325 P7	6.25 P7				
	Weirton, Wheeling, Follensbee, W. Va.					4.60 W3		4.325 W3	6.25 F3,W3	6.425 W3	9.10 W3		
	Youngstown, Ohio		\$84.50 C10	\$96.00 Y1, C10		4.60 Y1	6.75 Y1	4.325 U1, Y1	6.25 Y1,C5	6.425 U1, Y1	9.30 Y1	7.20 U1, Y1	13.45 C5
	Fontana, Cal.	\$76.00 K1	\$92.00 K1	\$115.00 K1		5.25 K1	7.40 K1	5.40 K1	5.975 K1	8.00 K1	7.525 K1	8.85 K1	
	Genova, Utah		\$84.50 C7			4.60 C7	6.75 C7						
	Kansas City, Mo.					4.70 S2	6.85 S2			6.675 S2		7.45 S2	
	Los Angeles, Torrance, Cal.		\$94.00 B2	\$116.00 B2		5.30 C7, B2	7.45 B2	5.975 C7, B2	8.30 C1			8.40 B2	
	Minneapolis, Colo.					4.90 C6		5.425 C6					
	Portland, Ore.					5.35 O2							
SOUTH	San Francisco, Niles, Pittsburg, Cal.		\$94.00 B2			5.25 B2, P9	7.40 B2	5.975 B2, C7					
	Seattle, Wash.		\$98.00 B2			5.35 B2	7.50 B2	5.325 B2					
	Atlanta, Ga.							4.525 A8					
	Fairfield, Ala. City, Birmingham, Ala.	\$68.50 T2	\$84.50 T2			4.60 C16, R3,T2	6.75 T2	4.325 R3, C16,T2		6.425 T2			
	Houston, Lone Star, Tex.	\$74.50 L3	\$89.50 S2	\$101.00 S2		4.70 S2	6.85 S2			6.675 S2		7.45 S2	

IRON AGE

STEEL
PRICES(Effective
Oct. 11, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES (Effective Oct. 11, 1955)		SHEETS								WIRE ROD	TIN PLATE†		BLACK PLATE	
		Hot-rolled 10 ga. & heavy.	Cold- rolled	Galvanized 10 ga.	Enamel- ing 12 ga.	Long Tens 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot- rolled 19 ga.	Coke* 1/25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.	
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.325 B3	5.325 B3				6.375 B3	7.875 B3			W6	† Special coated mig. tens deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct \$2.20 from 1.25-lb. coke base box. * COKE: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differ- ential 1.00 lb.-0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conschocken, Pa.	4.375 A2	5.375 A2				6.425 A2							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.									5.025 B3				
	Fairless, Pa.	4.375 U1	5.375 U1				6.425 U1	7.925 U1			\$9.30 U1	\$8.00 U1		
	New Haven, Conn.													
	Phoenixville, Pa.													
Sparrows Pt., Md.	4.325 B3	5.325 B3	5.85 B3			6.375 B3	7.875 B3	8.80 B3		5.125 B3	\$9.30 B3	\$8.00 B3		
Worcester, Mass.										5.325 A5				
Trenton, N. J.														
MIDDLE WEST	Alien, Ill.										5.20 L1			
	Ashland, Ky.	4.325 A7		5.85 A7	5.90 A7									
	Canton-Massillon, Dover, Ohio			5.85 R1, R3										
	Chicago, Joliet, Ill.	4.325 A1, W8					6.375 U1				5.025 A5, N4 R3			
	Starnog, Ill.										5.125 N4			
	Cleveland, Ohio	4.325 J3, R3	5.325 J3, R3		5.90 R3		6.375 J3, R3	7.875 J3, R3			5.025 A5			
	Detroit, Mich.	4.425 G3, M2	5.425 G3, 5.325 M2				6.475 G3	7.975 G3						
	Newport, Ky.	4.325 N5	5.325 N5	5.85 N5										
	Gary, Ind. Harbor, Indiana	4.325 J3, U1, Y1	5.325 J3, U1, Y1	5.85 U1, I3	5.90 U1, I3	6.25 U1	6.375 Y1, U1, I3	7.875 U1, Y1			5.025 Y1	\$9.20 J3, U1, Y1	\$7.90 J3, U1, Y1	6.85 U1, Y1
	Granite City, Ill.	4.525 G2	5.525 G2	6.05 G2	6.10 G2								\$8.00 G2	6.75 G2
	Kokomo, Ind.	4.425 C9		5.95 C9						5.475 C9	5.125 C9			
Mansfield, Ohio	4.325 E2	5.325 E2			6.25 E2				E2					
Middletown, Ohio		5.325 A7	5.85 A7	5.90 A7	6.25 A7									
Niles, Warren, Ohio Sharon, Pa.	4.325 S1, R3, N3	5.325 R3, N3	5.85 R3, 6.85 N3	5.90 N3	6.25 N3	6.375 S1, R3	7.875 R3				\$9.20 R3	\$7.90 R3		
Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 J3, U1, P6	5.325 J3, U1, P6	5.85 U1	5.90 U1, A7		6.375 J3, U1	7.875 U1	8.80 U1		5.025 A5, P6	\$9.20 J3, U1	\$7.90 J3, U1	6.85 U1	
Portsmouth, Ohio	4.325 P7	5.325 P7								5.025 P7				
Weirton, Wheeling, Follansbee, W. Va.	4.325 W3, W5	5.325 W3, W5, F3	5.85 W3, W5		6.25 W3, W5	6.375 W3	7.875 W3				\$9.20 W3, W5	\$7.90 W3, W5	6.85 F3, W5	
Youngstown, Ohio	4.325 U1, Y1	5.325 Y1		5.90 Y1		6.375 U1, Y1	7.875 Y1			5.025 Y1				
WEST	Fontana, Cal.	5.075 K1	6.425 K1				7.125 K1	8.975 K1						
	Geneva, Utah	4.425 C7												
	Kansas City, Mo.										5.275 S2			
	Los Angeles, Torrance, Cal.										5.825 B2			
	Minnequa, Colo.										5.275 C6			
	San Francisco, Niles, Pittsburg, Cal.	5.025 C7	6.275 C7	6.60 C7							5.675 C7	\$9.95 C7	\$8.65 C7	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.325 R3, T2	5.325 T2	5.85 R3, T2			6.375 T2			5.425 R3	5.025 R3, T2	\$9.30 T2	\$8.00 T2	
	Houston, Tex.										5.275 S2			

IRON AGE

STEEL
PRICES(Effective
Oct. 11, 1968)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

	BARS						PLATES				WIRE	
	Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mir's. Bright	
EAST	Beltsheim, Pa.			5.575 B3	7.425 B3	6.80 B3						
	Buffalo, N. Y.	4.65 B3,R3	4.65 B3,R3	5.95 B5	5.575 B3,R3	7.425 B3,R3	6.80 B3	4.50 B3,R3				6.25 W6
	Claymont, Del.							4.50 C4		6.30 C4	6.725 C4	
	Coatesville, Pa.							4.50 L4		6.30 L4	6.725 L4	
	Conshohocken, Pa.							4.50 A2	5.575 A2		6.725 A2	
	Harrisburg, Pa.							5.10 C3	5.575 C3			
	Hartford, Conn.			6.40 R3		7.725 R3						
	Johnstown, Pa.	4.65 B3	4.65 B3		5.575 B3		6.80 B3	4.50 B3		6.30 B3	6.725 B3	6.25 B3
	Fairless, Pa.	4.80 U1	4.80 U1		5.725 U1							
	Newark, N. J.			6.35 W10		7.60 W10						
	Camden, N. J.			6.35 P10								
	Bridgeport, Putnam, Conn.	4.80 N8		6.45 W10	5.725 N8			4.750 N8				
	Sparrows Pt., Md.		4.65 B3					4.50 B3		6.30 B3	6.725 B3	6.35 B3
	Palmer, Worcester, Roadville, Mass.			6.35 W11 6.45 B5,C14		7.725 A5,B5		4.50 R3				6.55 A5, W6
	Spring City, Pa.			6.35 K4		7.60 K4						
MIDDLE WEST	Alton, Ill.	4.85 L1										6.425 L1
	Ashland, Newport, Ky.							4.50 A7,N5		6.30 N5		
	Centon-Massillon, Mansfield, Ohio	4.75 R3		5.90 R2,R3	5.575 R3,T5	7.425 R2,R3,T5		4.50 E2				
	Chicago, Joliet, Ill.	4.65 U1, N4,W8,R3, P13	4.65 N4,R3, P13	5.90 A5,W10, W8,B5,L2	5.575 U1,R3, W8	7.425 A5,W8, W10,L2,B5		4.50 U1,W8, J3,A1,R3	5.575 U1	6.30 U1	6.725 U1	6.25 A5,R3, N4,W7
	Cleveland, Ohio	4.65 R3	4.65 R3	5.90 A5,C13		7.425 A5,C13	6.80 R3	4.60 J3,R3	5.575 J3		6.725 R3,J3	6.25 A5, C13
	Detroit, Mich.	4.75 G3	4.75 G3	5.90 R5 6.10 B5,P8 6.15 P3	5.575 R5 5.675 G3	7.425 R5 7.625 B5,P3 P8	6.90 G3	4.60 G3			6.825 G3	
	Duluth, Minn.											6.25 A5
	Gary, Ind. Harbor, Crawfordsville	4.65 J3, U1, Y1	4.65 J3, U1, Y1	5.90 M5,R3	5.575 J3, U1, Y1	7.425 M5, R3	6.80 U1,J3, Y1	4.50 J3, U1,Y1	5.575 J3	6.30 U1,Y1	6.725 U1,J3, Y1	6.35 M4
	Granite City, Ill.							4.70 G2				
	Kokomo, Ind.											6.35 C9
	Sterling, Ill.	4.75 N4	4.75 N4									6.35 N4
	Niles, Warren, Ohio Sharon, Pa.	4.65 R3,C10		5.90 C10	5.575 C10	7.425 C10	6.80 R3	4.50 S1,R3		6.30 S1	6.725 S1	
	Pittsburgh, Pa. Midland, Pa.	4.65 J3, U1, C11	4.65 J3, U1	5.90 A5,C8, C11,J3, W10,B4,R3	5.575 U1,C11	7.425 A5,C11, W10,C8,R3	6.80 J3, U1	4.50 J3, U1	5.575 U1	6.30 U1	6.725 J3, U1	6.25 A5,J3, P6
	Portsmouth, Ohio											6.25 P7
	Worlton, Wheeling, Follansbee, W. Va.	4.65 W3						4.50 W3,W5				
	Youngstown, Ohio	4.65 U1,Y1, C10,R3	4.65 U1,Y1, R3	5.90 Y1, U1	5.575 U1,Y1, C10	7.425 Y1,C10 7.605 F2	6.80 U1,Y1	4.50 U1,Y1, R3		6.30 Y1	6.725 Y1	6.25 Y1
WEST	Emeryville, Cal.	5.40 J5	5.40 J5									
	Fontana, Cal.	5.35 K1	5.35 K1		6.625 K1		7.90 K1	5.15 K1		6.95 K1	7.375 K1	
	Genova, Utah							4.50 C7			6.725 C7	
	Kansas City, Mo.	4.90 S2	4.90 S2		5.825 S2		7.05 S2					6.50 S2
	Los Angeles, Torrance, Cal.	5.35 B2,C7	5.35 B2,C7	7.35 R3	6.625 B2		7.50 B2				7.425 B2	7.20 B2
	Minneapolis, Colo.	5.10 C6	5.10 C6					5.35 C6				6.50 C6
	Portland, Ore.	5.60 O2	5.60 O2									
	San Francisco, Niles, Pittsburg, Cal.	5.35 C7 5.40 B2,P9	5.35 C7 5.40 B2,P9				7.55 B2					7.20 C7
	Seattle, Wash.	5.40 B2,P12, N6	5.40 B2,P12				7.55 B2	5.40 B2		7.20 B2	7.625 B2	
SOUTH	Atlanta, Ga.	4.85 A8	4.85 A8									6.45 A8
	Fairfield, Ala. City, Birmingham, Ala.	4.65 T2,C16, R3	4.65 T2,C16, R3			6.80 T2		4.50 T2,R3			6.725 T2	6.25 R3, T2
	Houston, Ft. Worth, Lone Star, Tex.	4.90 S2	4.90 S2		5.825 S2	7.05 S2		4.85 L3 4.60 S2		6.40 S2	6.825 S2	6.50 S2

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
 A2 Alan Wood Steel Co., Conahohocken, Pa.
 A3 Allegheny Ludlum Steel Corp., Pittsburgh
 A4 American Cladmetals Co., Carnegie, Pa.
 A5 American Steel & Wire Div., Cleveland
 A6 Angell Nail & Chaplet Co., Cleveland
 A7 Armco Steel Corp., Middletown, O.
 A8 Atlantic Steel Co., Atlanta, Ga.
 B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
 B2 Bethlehem Pacific Coast Steel Corp., San Francisco
 B3 Bethlehem Steel Co., Bethlehem, Pa.
 B4 Blair Strip Steel Co., New Castle, Pa.
 B5 Bliss & Laughlin, Inc., Harvey, Ill.
 B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
 C1 Calstrip Steel Corp., Los Angeles
 C2 Carpenter Steel Co., Reading, Pa.
 C3 Central Iron & Steel Co., Harrisburg, Pa.
 C4 Claymont Products Dept., Claymont, Del.
 C5 Cold Metal Products Co., Youngstown, O.
 C6 Colorado Fuel & Iron Corp., Denver
 C7 Columbia Geneva Steel Div., San Francisco
 C8 Columbia Steel & Shafting Co., Pittsburgh
 C9 Continental Steel Corp., Kokomo, Ind.
 C10 Copperweld Steel Co., Pittsburgh, Pa.
 C11 Crucible Steel Co. of America, Pittsburgh
 C12 Cumberland Steel Co., Cumberland, Md.
 C13 Cuyahoga Steel & Wire Co., Cleveland
 C14 Compressed Steel Shafting Co., Readville, Mass.
 C15 G. O. Carlson, Inc., Thorndale, Pa.
 C16 Connors Steel Div., Birmingham
 C17 Chester Blast Furnace Inc., Chester, Pa.
 D1 Detroit Steel Corp., Detroit
 D2 Detroit Tube & Steel Div., Detroit
 D3 Driver Harris Co., Harrison, N. J.
 D4 Dickson Weatherproof Nail Co., Evanston, Ill.
 D5 Henry Dinton & Son, Inc., Philadelphia
 E1 Eastern Stainless Steel Corp., Baltimore
 E2 Empire Steel Co., Mansfield, O.
 F1 Firth Sterling, Inc., McKeesport, Pa.
 F2 Fitzsimmons Steel Corp., Youngstown
 F3 Follansbee Steel Corp., Follansbee, W. Va.
 G1 Globe Iron Co., Jackson, O.

G2 Granite City Steel Co., Granite City, Ill.
 G3 Great Lakes Steel Corp., Detroit
 G4 Greer Steel Co., Dover, O.
 H1 Hanna Furnace Corp., Detroit
 I2 Ingersoll Steel Div., Chicago
 I3 Inland Steel Co., Chicago
 I4 Interlake Iron Corp., Cleveland
 J1 Jackson Iron & Steel Co., Jackson, O.
 J2 Jessup Steel Corp., Washington, Pa.
 J3 Jones & Laughlin Steel Corp., Pittsburgh
 J4 Joslyn Mfg. & Supply Co., Chicago
 J5 Judson Steel Corp., Emeryville, Calif.
 K1 Kaiser Steel Corp., Fontana, Cal.
 K2 Keystone Steel & Wire Co., Peoria
 K3 Koppers Co., Granite City, Ill.
 K4 Keystone Drawn Steel Co., Spring City, Pa.
 L1 Laclede Steel Co., St. Louis
 L2 La Salle Steel Co., Chicago
 L3 Lone Star Steel Co., Dallas
 L4 Lukens Steel Co., Coatesville, Pa.
 M1 Mahoning Valley Steel Co., Niles, O.
 M2 McLouth Steel Corp., Detroit
 M3 Mercer Tube & Mfg. Co., Sharon, Pa.
 M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
 M5 Monarch Steel Div., Hammond, Ind.
 M6 Mystic Iron Works, Everett, Mass.
 N1 National Supply Co., Pittsburgh
 N2 National Tube Div., Pittsburgh
 N3 Niles Rolling Mill Div., Niles, O.
 N4 Northwestern Steel & Wire Co., Sterling, Ill.
 N5 Newport Steel Corp., Newport, Ky.
 N6 Northwest Steel Rolling Mills, Seattle
 N7 Newman Crosby Steel Co., Pawtucket, R. I.
 N8 Northeastern Steel Corp., Bridgeport, Conn.
 O1 Oliver Iron & Steel Co., Pittsburgh
 O2 Oregon Steel Mills, Portland
 P1 Page Steel & Wire Div., Monaca, Pa.
 P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
 P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
 P4 Pittsburgh Coke & Chemical Co., Pittsburgh
 P5 Pittsburgh Screw & Bolt Co., Pittsburgh
 P6 Pittsburgh Steel Co., Pittsburgh
 P7 Portsmouth Div., Detroit Steel Corp., Detroit
 P8 Plymouth Steel Co., Detroit

P9 Pacific States Steel Co., Niles, Cal.
 P10 Precision Drawn Steel Co., Camden, N. J.
 P11 Production Steel Strip Corp., Detroit
 P12 Pacific Steel Rolling Mills, Seattle
 P13 Phoenix Mfg. Co., Joliet, Ill.
 R1 Reeves Steel & Mfg. Co., Dover, O.
 R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
 R3 Republic Steel Corp., Cleveland
 R4 Roebbing Sons Co., John A., Trenton, N. J.
 R5 Rotary Electric Steel Co., Detroit
 R6 Rodney Metals, Inc., New Bedford, Mass.
 R7 Rome Strip Steel Co., Rome, N. Y.
 S1 Sharon Steel Corp., Sharon, Pa.
 S2 Sheffield Steel Corp., Kansas City
 S3 Shenango Furnace Co., Pittsburgh
 S4 Simonds Saw & Steel Co., Fitchburg, Mass.
 S5 Sweet's Steel Co., Williamsport, Pa.
 S6 Standard Forging Corp., Chicago
 S7 Stanley Works, New Britain, Conn.
 S8 Superior Drawn Steel Co., Monaca, Pa.
 S9 Superior Steel Corp., Carnegie, Pa.
 S10 Seneca Steel Service, Buffalo
 T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
 T2 Tennessee Coal & Iron Div., Fairfield
 T3 Tennessee Products & Chem. Corp., Nashville
 T4 Thomas Strip Div., Warren, O.
 T5 Timken Steel & Tube Div., Canton, O.
 T6 Tremont Nail Co., Warcham, Mass.
 T7 Texas Steel Co., Fort Worth
 T8 Thompson Wire Co., Boston
 U1 United States Steel Corp., Pittsburgh
 U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
 U3 Ulbrich Stainless Steels, Wallingford, Conn.
 U4 U. S. Pipe & Foundry Co., Birmingham
 W1 Wallingford Steel Co., Wallingford, Conn.
 W2 Washington Steel Corp., Washington, Pa.
 W3 Weirton Steel Co., Weirton, W. Va.
 W4 Wheatland Tube Co., Wheatland, Pa.
 W5 Wheeling Steel Corp., Wheeling, W. Va.
 W6 Wickwire Spencer Steel Div., Buffalo
 W7 Wilson Steel & Wire Co., Chicago
 W8 Wisconsin Steel Co., S. Chicago, Ill.
 W9 Woodward Iron Co., Woodward, Ala.
 W10 Wycoll Steel Co., Pittsburgh
 W11 Worcester Pressed Steel Co., Worcester, Mass.
 Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (per) l.b. mills. Base price about \$200 per net ton.

	BUTTWELD												SEAMLESS											
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2-3 in.		2 in.		2 1/2 in.		3 in.		3 1/2-4 in.			
	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.
STANDARD T. & C.																								
Sparrows Pt. B3	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75										
Youngstown B3	17.50	0.25	20.50	4.25	23.00	7.75	25.50	9.00	26.00	10.00	26.50	10.50	28.00	10.75										
Fontana K1	6.00	+9.25	9.00	+5.25	11.50	+1.75	14.00	+1.00	14.50	+0.00	15.00	8.50	16.50	0.25										
Pittsburgh J3	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25		
Alton, Ill. L1	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75										
Sharon M3	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75										
Fairless N2	15.00	0.25	18.00	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75										
Pittsburgh N1	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25		
Wheeling W5	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75										
Wheatland W4	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25		
Youngstown Y1	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75										
Indiana Harbor Y1	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75										
Lorain N2	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25		
EXTRA STRONG																								
PLAIN ENDS																								
Sparrows Pt. B3	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75										
Youngstown B3	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75										
Fairless N2	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75										
Fontana K1	10.50		14.50		16.50		17.00		17.50		18.00		18.50											
Pittsburgh J3	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75		
Alton, Ill. L1	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75										
Sharon M3	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75										
Pittsburgh N1	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75		
Wheeling W5	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75										
Wheatland W4	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75		
Youngstown Y1	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75		
Indiana Harbor Y1	21.0	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75										
Lorain N2	22.0	8.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75		

Threads only, butt weld and seamless 2 1/4 pt higher discount. Plain ends, butt weld and seamless 3-in. and under, 4 1/2 pt higher discount. Butt weld jobbers discount, 5 pt.
 Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb., East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2 in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

Steel Prices (Effective Oct. 11, 1955)

To identify producers, see Key on preceding page.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb.	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer U1	4.725	5.65	5.825				
So. Chicago R3				7.50			
Enley T2	4.725	5.65					
Fairfield T2		5.65			5.625		
Gary U1	4.725	5.65			5.625		
Ind. Harbor I5	4.725		5.825	7.50			
Johnstown B3		5.65					
Joliet U1		5.65	5.825				
Kansas City S2				7.90			
Lackawanna B3	4.725	5.65	5.825		5.625	12.40	
Minneapolis C6	4.725	6.15	5.825	7.50	5.625	12.40	
Pittsburgh O1				11.90		12.40	
Pittsburgh J3					7.90		
Seattle B2					8.40	5.775	12.90
Stenton B1	4.725		5.825		5.625		
Struthers Y1				7.90			
Torrance C7						5.775	
Williamport S3		5.65					
Youngstown R3				7.90			

ELECTRICAL SHEETS

22-Gage	Hot-Rolled	Cold-Reduced
F.o.b. Mill Cents Per Lb.	(Cut Lengths) *	(Coiled or Cut Length)
		Semi- Processed
Field	8.40	8.60
Armstrong	9.35	9.60
Elect.	9.95	10.20
Met.	10.95	11.20
Dynamo	11.85	12.10
Trans. 72	12.80	13.05
Trans. 65	13.35	13.60
Trans. 58	13.85	14.10
Trans. 52	14.85	15.10

* Producing points: Beach Bottom (W5); Brackenridge (A3); Granite City (G7); Indiana Harbor (I5); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville (A7).

* Coils 75¢ higher.

WARE- HOUSES

		Base price, f.o.b., dollars per 100 lb.											
		Sheets		Strip		Plates		Shapes		Bars		Alloy Bars	
Cities	City Delivery Charge	Hot-Rolled	Cold-Rolled	Galvanized (16 gage)	Hot-Rolled	Cold-Rolled	Standard Structural	Hot-Rolled	Cold- Finished	Hot-Rolled 4140	Hot-Rolled 4140 Annealed	Cold-Drawn 4415 As rolled	Cold-Drawn 4140 Annealed
Baltimore	5.10	7.03	8.32	9.10	7.65		7.21	7.93	7.61	8.62	14.38	13.44	16.29- 16.49
Birmingham	15	6.80	7.93	8.85	7.06		6.99	7.28	7.09	9.35			
Boston	10	7.70	8.81	10.27	7.94	10.30	7.89	8.13	7.83	9.53	13.65	13.40	16.50
Buffalo	30	6.90	8.05	9.77	7.15		7.15	7.40	7.10	7.90	13.10		16.15
Chicago	25	6.80	8.34	8.50	7.06		6.99	7.28	7.08	7.75	13.20	12.85	15.90
Cincinnati	25	6.92	8.33	8.90	7.30		7.28	7.75	7.32	8.05	13.44	13.09	16.14
Cleveland	30	6.80	8.39	8.65	7.16		7.16	7.61	7.14	7.85		12.91	15.96
Denver		8.60	10.00	11.22	8.90		8.60	8.75	8.90	9.82			17.97
Detroit	25	6.99	8.53	8.78	7.34	8.15	7.27	7.75	7.36	8.04	13.40	13.05	16.10
Houston		7.05	8.75	10.49	8.15		7.80	8.20	8.25	9.65	14.35	14.00	17.15
Kansas City	20	7.47	8.60	9.17	7.73		7.66	7.95	7.75	8.52		13.52	
Los Angeles	10	8.95	10.00	11.00	8.35		8.05	8.30	8.05	11.25		14.25	17.85
Memphis	10	7.12	8.25		7.38		7.31	7.60	7.40	9.15			
Milwaukee	25	6.89	8.43	8.59	7.15		7.08	7.45	7.17	7.94		12.94	15.99
New Orleans	15	7.20	8.35		7.45		7.40	7.70	7.50	9.50			
New York	10	7.46	8.68	9.44	8.07	9.95	7.76	7.99	7.96	9.48	13.63	13.28	16.48
Norfolk	20	7.25			7.65		7.45	7.95	7.65	9.50			
Philadelphia	10	7.14	8.42	9.35	7.67		7.37	7.74	7.44	8.46	13.51	13.16	16.31
Pittsburgh	25	6.80	8.34	9.20	7.16	9.00	6.99	7.28	7.00	7.85	13.20	12.85	16.05
Portland		7.60	8.80	10.65	8.60		7.75	7.85	7.95	11.80		15.00	17.50
Salt Lake City	20		10.60		9.35			9.20	9.15				
San Francisco	10	8.10	9.65	10.15	8.35		8.05	8.35	8.05	11.20*		14.25	17.85
Seattle	00	8.55	10.40	10.80	8.65		8.20	8.30	8.35	11.70		14.60	17.65
St. Louis	25	7.09	8.63	9.19	7.35		7.28	7.68	7.37	8.14	13.49	13.14	16.35
St. Paul	25	7.46	8.59- 9.14	9.16	7.72		7.65	7.94	7.74	8.51		13.51	16.38

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 999 lb. All others: 2000 to 999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (*) 1500 to 9999 lb. (2) 1000 lb or over. (3) 8.25 delivery. (4) 1000 to 999 lb. \$2.25 delivery.

* Plus analysis charge.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire	1/2" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbed Wire	Merch. Wire Ann Id	Merch. Wire Galv.
	Cal	Cal	Cal	Cal	Cal	Cal	Cal
Alabama City R3	152	162		173	175	7.40	7.80
Altoona, Pa. J1	152	162				7.40	7.80
Atlanta A8	154	167		175	180	7.50	8.025
Bartonville K2*	154	168		175	181	7.50	8.075
Buffalo W6						7.40	7.80
Chicago, Ill. N4*	152	166		173	179	7.40	8.00
Cleveland A6	157					7.40	
Cleveland A5						7.40	
Crawfordsville M4*	154	167		175	175	7.50	8.05
Danora, Pa. A5	152	162		173	173	7.40	7.80
Duluth A5	152	162		173	175	7.40	7.80
Fairfield, Ala. T2	152	162		173	175	7.40	7.80
Galveston D4	157						
Houston S2	167	170		180	7.65	8.05	
Johnstown, Pa. B3*	152	166				7.40	7.80
Joliet, Ill. A5	152	162		173	175	7.40	7.80
Kokomo, Ind. C3	154	154		177	177	7.50	7.90
Los Angeles B2*						8.35	8.925
Kansas City S2	167	174		178	180	7.65	8.05
Minneapolis C6	157	167	162	178	180	7.65	8.05
Monessen P6	152	167				7.40	7.80
Moline, Ill. R3		162	162				
Pittsburg, Cal. C7	171	185			195	8.35	8.75
Portsmouth P7						7.40	
Randolph, Pa. A5	152	163			175	7.40	7.80
So. Chicago R3	152	162	157	173	177	7.40	7.80
S. San Francisco C6					197	195	8.35
Sparrows Pt. B3*	154				173	181	7.50
Struthers, O. Y1						7.40	7.80
Worcester A5	158					7.70	
Williamport, Pa. S3		160					

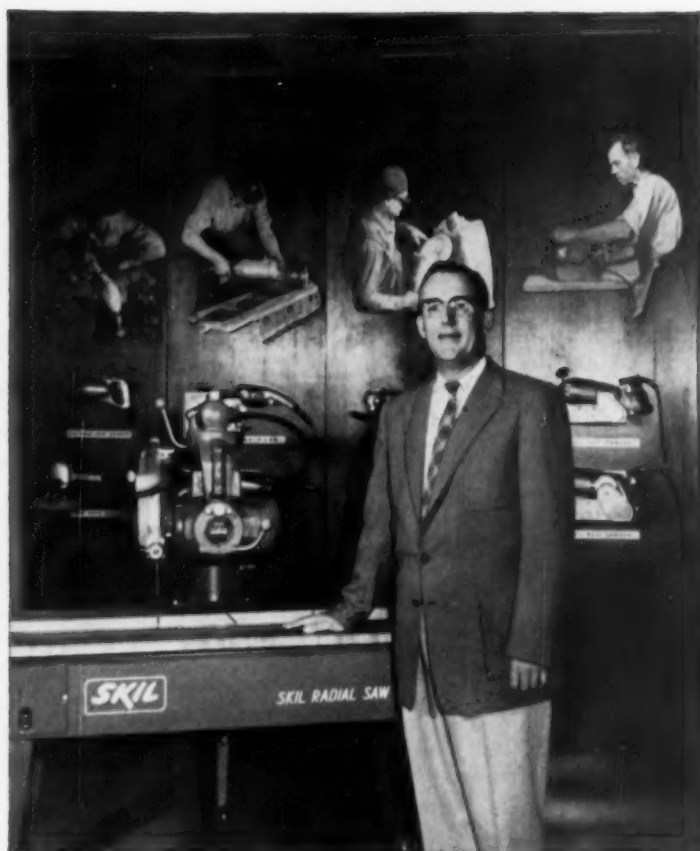
Galvanized products computed with zinc at 5¢ per lb. Exceptions: * zinc at 12.5¢ per lb; ** 13¢ zinc.

C-R SPRING STEEL

		CARBON CONTENT				
Cents Per Lb F.o.b. Mill		0.25	0.41	0.61	0.81	1.06
		0.40	0.60	0.80	1.05	1.35
Buffalo, N. Y. R7	7.00	8.95	10.50		12.65	15.35
Caregin, Pa. S3		8.95	10.50		12.65	15.35
Cleveland A5	7.00	8.95	10.50		12.65	15.35
Detroit D1	7.10	9.05	10.60		12.75	
Detroit D2	7.10	9.05	10.60			
Harrison, N. J. C11			10.80		12.95	15.65
Indianapolis C5	7.15	9.10	10.50		12.65	15.35
New Castle, Pa. B4	7.00	8.95	10.50		12.65	
New Haven, Conn. D1	7.45	9.25	10.80		12.95	
Pawtucket, R. I. N7	7.55	9.25	10.80		12.95	15.65
Pittsburgh S2	7.80	9.25	10.50		12.65	15.35
Riverdale, Ill. A1	7.10	8.95	10.50		12.65	15.35
Sharon, Pa. S1	7.00	8.95	10.50		12.65	15.35
Trenton R4						
Wallingford W1	7.45	9.25	10.80		12.95	15.65
Warren, Ohio T4	7.00	8.95	10.50		12.65	15.35
Weirton, W. Va. W3	7.10	8.95	10.50			
Worcester, Mass. A5	7.85	9.25	10.80		12.95	15.65
Youngstown C5	7.00	8.95	10.50		12.65	15.35

BOILER TUBES

		Size		Seamless		Elec. Weld	
\$ per 100 ft. carload lots, cut 10 to 24 ft.		F.o.b. Mill					
		OD-In.	R.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox	2	13	30.87	36.51	29.94		
	2 1/2	12	41.37	49.16	40.31		
	3	12	47.99	56.76	46.54		
	3 1/2	11	56.03	66.27	54.34		
	4	10	74.41	88.00	72.16		
National Tube	2	13	30.87	36.51	29.94		
	2 1/2	12	42.37	49.16	40.31		
	3	12	47.99	56.76	46.54		
	3 1/2	11	56.03	66.27	54.34		
	4	10	74.41	88.00	72.16		
Pittsburgh Steel	2	13	30.87	36.51			
	2 1/2	12	41.37	49.16			
	3	12	47.99	56.76			
	3 1/2	11	56.03	66.27			
	4	10	74.41	88.00			



R. W. Christensen, assistant to the vice president, SKIL Corp., Chicago, Ill., says:


"We increased our production efficiency by using Wyandotte Pre-Fos"

"We originally bought PRE-Fos* for an in-process rust preventative," says R. W. Christensen, assistant to the vice-president of SKIL Corporation, famous makers of power tools. "We found that it provided such an excellent surface for paint, that we now treat with PRE-Fos all product parts that are to be painted. Production efficiency has increased—for it also does a better job of cleaning than our previous process. And paint *definitely* adheres better to PRE-Fos-treated surfaces."

PRE-Fos is outstanding for cleaning and phosphatizing steel, as well as nonferrous metals. It removes shop dirt and fabricating soil . . . in a spray washer or soak tank! PRE-Fos deposits a fine-grained phosphate coating, increasing the metal's corrosion resistance, and providing an excellent base for paint.

You can improve the quality of your "finish" with Wyandotte PRE-Fos—for cleaning and phosphatizing metal surfaces before paint application. You'll cut operating costs, too, because of PRE-

Fos' low, low use-cost! Call your nearest Wyandotte representative today! Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, Calif. Offices in principal cities. *REG. U.S. PAT. OFF.

 **Wyandotte**
CHEMICALS
J. B. FORD DIVISION

Specialists in Metal-Cleaning Products

October 13, 1955

169



SKIL Corporation treats all metal parts with PRE-Fos to prevent rust; provide paint base.

Miscellaneous Prices

(Effective Oct. 11, 1955)

TOOL STEEL

W.	Cr	V	Mo	Co	per lb
18	4	1	—	—	\$1.60
18	4	1	—	5	2.305
18	4	2	—	—	1.765
1.5	4	1.5	8	—	.96
6	4	2	8	—	1.35
6	4	2	8	—	1.195
High-carbon chromium					
Oil hardened manganese					
Special carbon					
Extra carbon					
Regular carbon					
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.					

CLAD STEEL

Base prices, cents per lb. f.o.b.

Cladding	Plate (A3, J2, L4)			Sheet (J2)	
	10 gal	15 gal	20 gal	20 gal	20 gal
304	30.30	33.15	36.93	32.50	
316	35.50	38.45	41.40	47.00	
321	32.00	34.85	37.75	37.25	
347	34.40	37.90	41.40	40.25	
405	25.00	29.60	33.35		
410, 430	25.30	29.10	32.85		

CR Strip (89) Copper, 10 pct., 2 sides, \$8.00; 1 side, \$6.00.

LAKE SUPERIOR ORES

\$1.50% Fe; natural content, delivered lower Lake ports. Prices effective for 1955 season.

	Gross Ton
Openhearth lump	\$11.25
Old range, bessemer	10.40
Old range, nonbessemer	10.25
Menab, bessemer	10.25
Menab, nonbessemer	10.10
High phosphorus	10.00

COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	\$13.00 to \$13.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to \$16.50
Foundry, oven coke	
Buffalo, del'd	\$28.00
Chicago, f.o.b.	25.75
Detroit, f.o.b.	26.25
New England, del'd	26.05
Seaboard, N. J., f.o.b.	25.50
Philadelphia, f.o.b.	25.00
Swedeland, Pa., f.o.b.	25.00
Plainville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.45
Cincinnati, del'd	26.50
St. Paul, del'd	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	24.40
Lone Star, Tex., f.o.b.	19.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	23.00	40	100, 110	9.90
20	72	22.25	32	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.25	17	72	10.35
8	60	24.50	14	72	10.85
6	60	27.25	12	60	11.75
4	40	30.25	10	60	11.80
3	40	32.00	8	60	12.10
2 1/2	30	33.75			
2	24	32.50			

* Prices shown cover carbon nipples.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

	Discount	
1/2 in. & smaller x 4 in. & shorter	+5	17
1/2 in. & smaller x 6 in. & shorter	+12	11
9/16 in. & 1/2 in. x 6 in. & shorter	+13	10
1/2 in. & larger x 6 in. & shorter	+16	7
All diam. longer than 6 in. Rolled thread carriage bolts	+25	net
1/2 in. & smaller x 6 in. & shorter	+10	12
Lag, all diam. x 6 in. & shorter	+3	18
Lag, all diam. longer than 6 in.	+11	12
Plow bolts	18	18

Nuts, H.P., C.P., reg. & hvy.

	Base Discount or Key	Discount, Case
1/2" or smaller	55	64
3/4" to 1 1/4" inclusive	55	63
1 1/2" to 1 3/4" inclusive	57	65
1 3/4" and larger	51	61

C.P. Hex. regular & hvy.

1/2" or smaller	55	64
3/4" and larger	51	61

Hot Galv. Nuts (all types)

1/2" or smaller	38	50
3/4" to 1 1/4" inclusive	38	49

Finished, Semi-finished, Slotted or Castellated Nuts

1/2" and smaller	55	66
3/4" and larger	51	63

Rivets

	Base per 100 lb	Pot Off List
1/2 in. and larger	\$9.95	
7/16 in. and smaller		32

Cap Screws

	Discount	H.C. Heat
	Bright	Treated
New std. hex head, packaged		
1/4" thru 1/2" diam. x 6" and shorter	34	20
9/16 and 5/8" x 6" and smaller and shorter	31	16
3/4", 1" x 6" and shorter	8	+11
New std. hex head, bulk		
1/4" thru 1/2" diam. x 6" and shorter	49	41
9/16 and 5/8" diam. x 6" and shorter	48	39
3/4", 1" x 6" and shorter	31	20

*Minimum quantity per item:
15,000 pieces 1/4", 5/16", 3/8" diam.
5,000 pieces 7/16", 1/2", 9/16", 5/8" diam.
2,000 pieces 3/4", 1", 1 1/4" diam.

Machine Screws & Stove Bolts

	Discount	Mach. Stove
	Screws	Bolts
Packaged, package list	27	38
Bulk, bulk list		
1/4 in. diam. & under 5/16 in. diam. & larger	25,000-200,000	20 61
All diam. over 3 in. long	15,000-100,000	20 61
	5,000-100,000	— 61

Machine Screw & Stove Bolt Nuts

	Discount	Hex Square
	24	27
Packaged, package list		
Bulk, bulk list		
1/4 in. diam. & smaller	25,000-200,000	18 20

CAST IRON WATER PIPE INDEX

Birmingham	109.3
New York	121.5
Chicago	122.9
San Francisco-L.A.	131.1

Sept. 1955 value, Class B or heavier, 4 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00) ..	\$122.00
No. 1 Ohio	114.00
Sec. quality, Pa., Md., Ky., Mo., Ill. No. 2 Ohio	114.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	18.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$128.00
Childs, Hays, Pa.	133.00
Chicago District	138.00
Western Utah	
California	
Super Duty	
Hays, Pa., Athens, Tex., Windham, Calif.	145.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	21.00
Silica cement, net ton, bulk, Hays, Pa.	24.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	22.00
Silica cement, net ton, bulk, Utah and Calif.	

Chrome Brick

Standard chemically bonded, Balt.	Per net ton
Standards chemically bonded, Curtnier, Calif.	\$6.25
Burned, Balt.	80.00

Magnesite Brick

Standard Baltimore	\$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite

Domestic, f.o.b. Baltimore	St. % in. grains
in bulk fines removed	\$64.40
Domestic, f.o.b. Chewelah, Wash., Luning, Nev.	40.00
in bulk	46.00
in sacks	46.00

Dead Burned Dolomite

F.o.b. bulk, producing points in:	Per net ton
Pa., W. Va., Ohio	\$15.00
Midwest	15.60
Missouri Valley	14.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.	
Swedish sponge iron c.i.f.	11.25¢
New York, ocean bags ...	9.5¢
Canadian sponge iron, Del'd in East, carloads ...	10.75¢
Domestic sponge iron, 98+% Fe, carload lots	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe ..	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 00.8+% Fe ..	\$3.0¢ to \$1.48
Aluminum	31.5¢
Brass, 10 ton lots	29.50¢ to 38.50¢
Copper, electrolytic	57.75¢
Copper, reduced	57.75¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd ...	\$3.60
Lead	23.50¢
Manganese	57.0¢
Molybdenum, 99%	\$2.75
Nickel, unannealed	\$9.50¢
Nickel, annealed	\$6.50¢
Nickel, spherical, unannealed	\$3.50¢
Silicon	\$2.50¢
Solder powder	3.0¢ to 9.0¢ plus met. value
Stainless steel, 302	91.0¢
Stainless steel, 316	\$1.10
Tin	14.04¢ plus metal value
Tungsten, 99% (65 mesh) ..	\$4.50
Zinc, 10 ton lots	17.5¢ to 25.0¢

CORROSION FACTORS

1. PROCESS OR OPERATION: (e.g., heat treating, vitreous enameling, hydrocarbon reactions, etc.) _____

2. HEATING PRACTICE: Analysis of fuel _____

Temperature °F. or °C. Maximum _____

Time at temperature _____

Method of cooling (e.g., furnace cool, oil quench, etc.) _____

Frequency of heating and cooling _____

Magnitude of operating stress _____

3. ENVIRONMENT: Chemical composition of atmosphere, fused salt, molten metal, etc. in contact with metal surface _____

In the case of an atmosphere, give dew point _____

Concentration of sulfur compounds, if any, preferably in grains sulfur per 100 cu. ft. of atmosphere _____

EQUIPMENT

4. EQUIPMENT OR PART: (e.g., radiant tube, boiler, etc.) _____

5. METAL OR ALLOY OR OTHER MATERIAL USED: _____

6. DIMENSIONS: Size and thickness of rod, sheet, plate _____


EXPERIENCE

7. SERVICE LIFE OF MATERIAL USED: _____

8. TYPE OF FAILURE: (e.g., cracking, sagging, general corrosion) _____

HIGH TEMPERATURE WORK SHEET

Date _____



When you need suggestions on a specific high temperature problem...

The High Temperature Work Sheet has been designed to make it easy for you to outline your problem as completely as possible and to make sure no significant factors will be overlooked. The completed form will assure your receiving information most applicable to your particular requirements.

Use this Work Sheet as a convenience in stating your problem in the event that you:

- 1 Are undertaking a new process involving the possibilities of corrosion at temperatures with which you have not had operating experience.
- 2 Wish to compare the performance to be expected from other metals and alloys with that of materials previously used and found satisfactory.

- 3 Require a substitute for an alloy or material at present not readily available.

Fill in and return this coupon.

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..... Please send me the High Temperature Work Sheet so that I may outline my problem to you.

..... Name _____ Title _____

..... Company _____

..... Address _____

..... City _____ State _____

.....

Ferroalloy Prices

(Effective Oct. 11, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 67-71% Cr, 20-1.00% max. Si.

0.02% C ... 28.50	0.20% C ... 35.50
0.06% C ... 36.50	0.50% C ... 36.25
0.10% C ... 36.00	1.00% C ... 34.00
0.15% C ... 35.75	2.00% C ... 33.75
4.00-4.50 C, 67.70% Cr, 1-2% Si ... 26.25	
3.50-5.00% C, 57-64% Cr, 2.00-4.00% Si ... 25.00	

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads ... 28.65
Ton lots ... 30.55
Less ton lots ... 22.05

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C ... \$1.27
0.50% max. C ... 1.27
9 to 11% C, 88-91% Cr, 0.75% Fe ... 1.36

Low Carbon Ferrochrome Silicon

(Cr 24-41%, Si 42-45%, C 0.05% max.)

Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads ... 41.85
Ton lots ... 46.15
Less ton lots ... 48.65

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.

30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads ... 22.95
Ton lots ... 25.25
Less ton lots ... 26.75

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads ... 23.05
Ton lots ... 24.95
Less ton lots ... 25.95

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.

Ton lots ... 19.65
Less ton lots ... 20.90

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots ... 16.60
Ton lots ... 18.10
Less ton lots ... 19.35

Graphidex No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed ... 17.50
Ton lots to carload packed ... 18.25
Less ton lots ... 19.50

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point

Marietta, Ashland, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore. ... 9.50
Clariton, Pa. ... 9.50
Sheridan, Pa. ... 9.50
Philo, Ohio ... 9.50

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn ... 12.10
Carloads, bulk ... 14.30
Ton lots packed ... 14.30

Spiegelstein

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	Price
16 to 19%	3% max.	\$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

55.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed ... 45.00
Ton lots ... 43.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads ... 30.00
Ton lots ... 32.00
250 to 1999 lb ... 34.00
Premium for hydrogen-removed metal ... 0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ... 21.85

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

Carloads	Ton	Less
0.07% max. C, 0.09% P, 90% Mn ... 32.00	33.85	35.05
0.17% max. C ... 29.95	31.80	33.80
0.15% max. C ... 28.45	30.30	31.50
0.30% max. C ... 26.95	28.80	30.00
0.50% max. C ... 26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si ... 23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk ... 11.20
Ton lots ... 12.65
Briquet contract basis carloads, bulk, delivered, per lb of briquet ... 12.76
Ton lots, packed ... 14.90

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$87.50 gross ton, freight allowed to normal trade area.

Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$90.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 17%. Add \$1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96.50% Si, 2% Fe ... 22.75	21.45	
98% Si, 1% Fe ... 23.25	21.95	

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk ... 6.75
Ton lots, packed ... 9.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

50% Si ... 11.75	75% Si ... 15.40
65% Si ... 14.50	85% Si ... 17.10
90% Si ... 18.50	

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

Ton lots	Cast	Turnings	Distilled
... \$2.05	... \$2.95	... \$3.75	
Less ton lots ... 2.40	3.30	4.55	

Ferrovandium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth ... 3.10
Crucible ... 3.10
High speed steel (Primus) ... 3.30

Atsifer, 20% Al, 40% Si, 40% Fe, Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ... 10.35¢
Ton lots ... 11.50¢

Calcium molybdate, 46.3-46.6% f.o.b. Langloeth, Pa., per pound contained Mo ... \$1.28

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots ... \$6.90
Less ton lots ... 6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont Cb plus Ta ... \$4.65

Ferronomolybdenum, 55-75%, 200-lb containers, f.o.b. Langloeth, Pa., per pound contained Mo ... \$1.46

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton ... \$90.00

10 tons to less carload ... \$110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... \$1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ... \$1.50

Less ton lots ... \$1.50

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton ... \$177.00

Ferrotungsten, 1/4 x down, packed, per pound contained W, ton lots, f.o.b. ... \$3.45

Molybdenic oxide, briquets, per lb contained Mo, f.o.b. Langloeth, Pa. ... \$1.27

bag, f.o.b. Washington, Pa., Langloeth, Pa. ... \$1.24

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb. Carload, bulk lump ... 15.50¢

Ton lots, packed lump ... 16.75¢

Less ton lots, lump packed ... 17.25¢

Vanadium oxide, 86-89% V₂O₅ contract basis, per pound contained V₂O₅ ... \$1.33

Zirconium contract basis, per lb of alloy 25-40%, f.o.b. freight allowed, carloads, packed ... 26.25¢

12-15%, del'd, lump, bulk-carloads ... 8.50¢

Boron Agents

Borasil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B, 3.14%, Si, 40-45%, per lb contained 2 ... \$5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound ... 45¢
Less ton lots, per pound ... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed

Ton lots per pound ... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots ... 1.20

F.o.b. Wash., Pa.; 100 lb up

10 to 14% B85
14 to 19% B ... 1.20
19% min. B ... 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1 ... \$1.00

No. 79 ... 50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

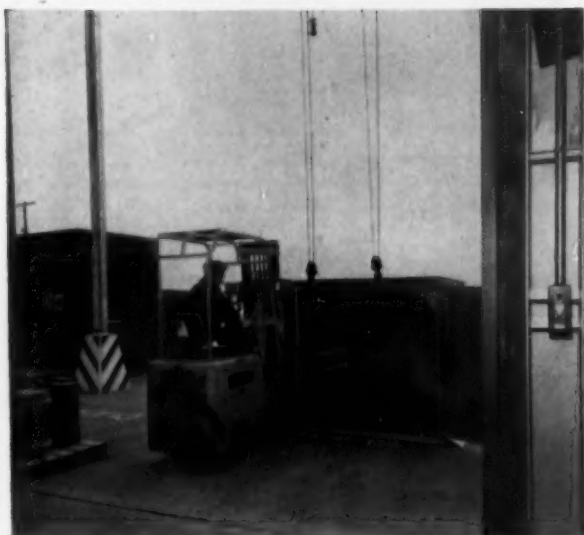
Ton lots ... \$1.46

Less ton lots ... 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots ... \$2.05

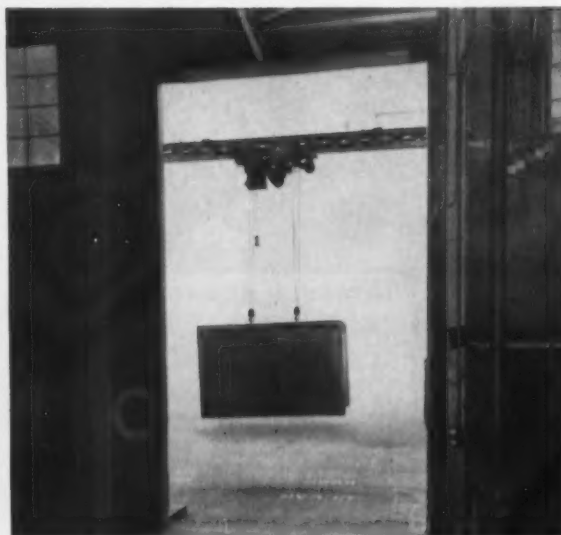
Silenz, contract basis, delivered.

Ton lots ... 45.00¢



1.

1. Loading carrier van with power truck.



2.

2. Up she goes. Depressing wall button sends carrier on its way.

3. En route to another building.



3.

Robot Carrier Delivers Materials Automatically

WITH a Cleveland Tramrail Robot Carrier, it is no problem to move materials between buildings. Heavy loads can be dispatched great distances without operators, safely, at low cost. The equipment opens and closes doors,

if necessary, and stops automatically upon reaching the selected delivery point.

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LELAND-GIFFORD COMPANY, WORCESTER, MASSACHUSETTS



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of Metals*

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CHUCKING MACHINES
Tool rotating Type

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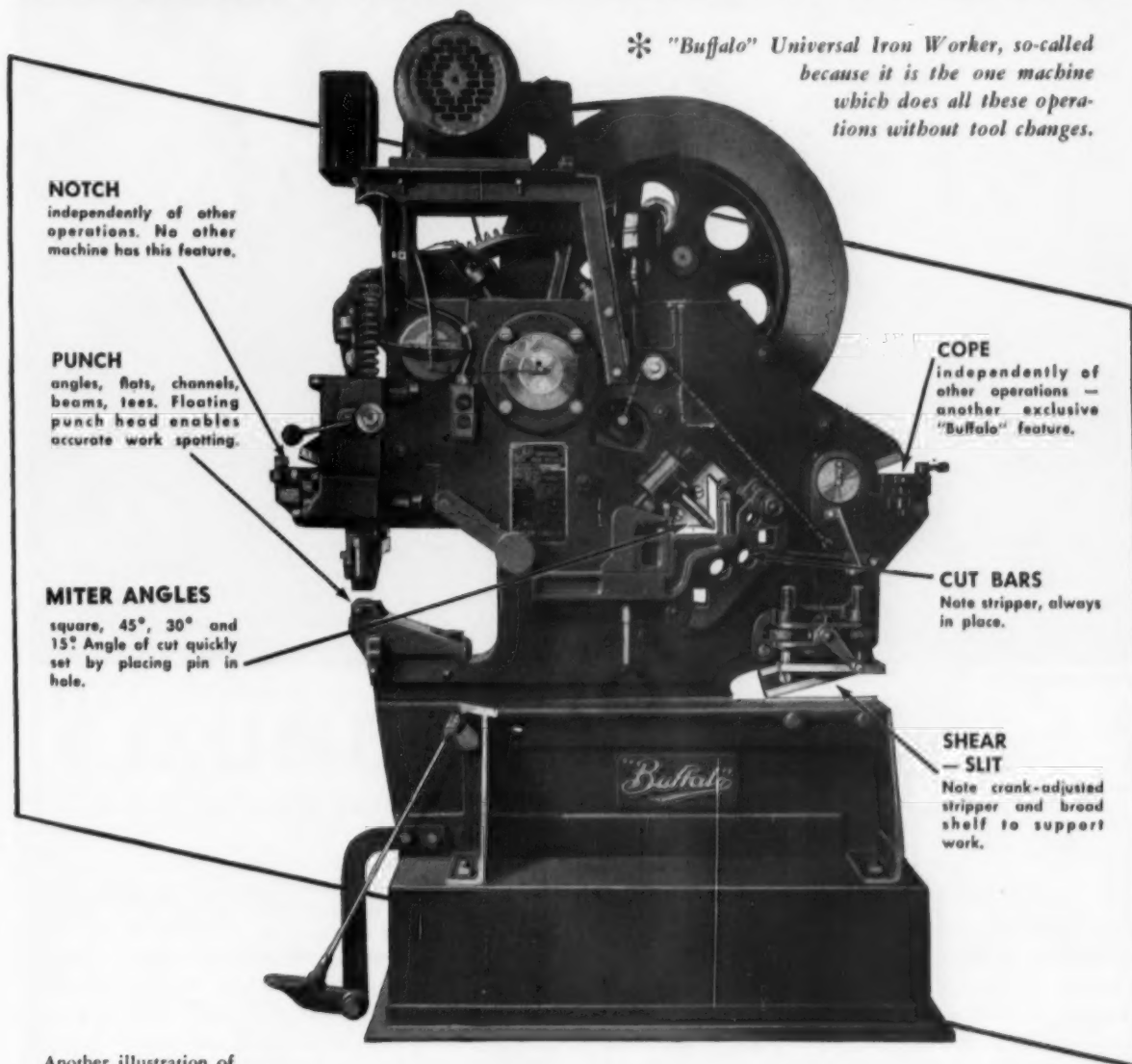
the Iron Age

Watch them every issue!

Use reply postcard on Page 121 to request
further information on products advertised
in this issue.

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* "Buffalo" Universal Iron Worker, so-called because it is the one machine which does all these operations without tool changes.



NOTCH

independently of other operations. No other machine has this feature.

PUNCH

angles, flats, channels, beams, tees. Floating punch head enables accurate work spotting.

MITER ANGLES

square, 45°, 30° and 15°. Angle of cut quickly set by placing pin in hole.

COPE

independently of other operations — another exclusive "Buffalo" feature.

CUT BARS

Note stripper, always in place.

SHEAR — SLIT

Note crank-adjusted stripper and broad shelf to support work.

Another illustration of the "Q" Factor in "Buffalo" machines—the built-in Quality which provides trouble-free satisfaction and long life.

A Universal Iron Worker will save space—time—excessive conveying of work from machine to machine in your shop—because it does so many jobs. Often called the "most useful machine in the shop." For complete details, write for Bulletin 360.



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BENDING

October 13, 1955

175



JOHN S. COLEMAN

Portrait by Fabian Bachrach

"I am proud that 80% of Burroughs Employees..."

"I am proud that 80% of Burroughs employees are enrolled in systematic savings in U. S. Savings Bonds through the Payroll Savings Plan. The record of the response of our men and women to our recent campaign speaks for itself. It is evidence of the desire to save, and to save in a way which benefits both the individual and the nation. I hope that every employer will take advantage of this opportunity to serve the interest of both his employees and the country by cooperating with the Department of the Treasury in the U. S. Savings Bonds campaign."

**JOHN S. COLEMAN, President
Burroughs Corporation**


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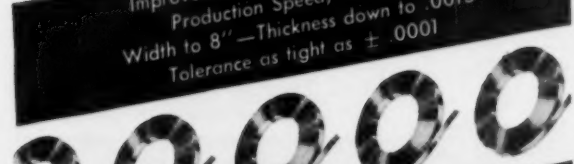




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Width to 8" — Thickness down to .0015
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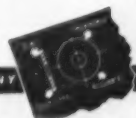


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THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Detroit Sales Hold . . . Sales of used machinery, which began to pick up this summer, are still going along at a rapid clip and dealers expect business to stay good at least through the fall and early part of next winter.

In some cases, dealers are expressing the opinion that the amount of business will even increase in that period.

There are several reasons for the optimism.

The booth maintained by the Machinery Dealers National Assn. at the Coliseum show in Chicago is beginning to show results. Dealers report that manufacturers and jobbers seemed impressed by the low cost and high productivity of rebuilt and used machines. Several inquiries are beginning to come in as a result of the show.

Confidence Helps . . . In addition, dealers believe that confidence in the future strength of the nation's economy has a great deal to do with the high rate of sales. The auto industry, biggest factor in the machine tool business here, is getting set for another big year and predictions are that production in 1956 will be as big as it was in 1955.

Another factor, which leads some observers to believe that business will get better, is the forthcoming production of the Volkswagen in New Jersey. The producers of the German automobile are presently in Detroit to accept bids on components for the car.

Lathes Lead . . . Meanwhile, late model lathes are the best sellers in the area right now. In several cases, dealers have not been able to keep up with the demand and are searching outside markets to fill their orders. Even then, they sometimes cannot find the particular type of lathe a customer wants.

The same holds true for presses,

especially the open-back, inclinable type which is used chiefly here by auto suppliers for stamping small parts.

Other types of equipment such as drills, jigs, boring machines and universal grinders are also moving well.

Oldtimers Sit . . . Inventories of older machines are somewhat high here because the market is limited. Dealers are slowly weeding out the inventories and the rate of discard continues at a steady pace.

September was the best month this year for sales and indications are that business in 1955 will probably be the best it has been since the end of the Korean War. Whether or not it will hold up after the first of the year remains to be seen but indications are that it will at least for a short time.

Philadelphia Lags . . . Dealers in Philadelphia are disappointed at the early-fall showing of used machinery. After a good summer, dealers were primed for a strong finish of the year.

The first two weeks of September were written off to the Machine Tool Show. Anyone who has anything to do with buying machinery figured to be there. But now the show is over and there has been no pickup.

What activity there is centers of course on late models and heavy equipment. Press brakes, squaring shears and large capacity bending rolls are doing well. Problem is to get what the trade wants. Dealers who can't are finding the going particularly rough.

No one can explain the lag. Normally business starts to pick up after Labor Day. The Chicago show, while it figured to take buyers out of the market for a while, should have had a stimulating effect in the long run. Business should be better but that doesn't bring in sales or make dealers any happier. Right now business is off.

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ANGLE BENDING ROLL

No. 3 Niagara Angle Bending Roll
No. 2 Buffalo Angle Bending Roll

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#125-TC Galland Henning, Volume of Box 145 cu.
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8" x 8/16" Bertch Initial Type
12" x 1/4" Niles Pyramid Type
18" x 1/4" Bertch Initial Type Bending Roll
18" x 1/4" Wicks Pyramid Type
20" x 1" Niles & Jones Pyramid Type Bending Roll

BRAKES—LEAF TYPE

8" x 1/4" Dreis & Krump Size 106
8" x 1/4" Dreis & Krump
13" x 1/4" Dreis & Krump, Motor Driven

BRAKES—PRESS TYPE

15" All Steel Press Brake, 250 ton Capacity
15" x 1/4" Cincinnati No. 70

CAN PULLER

Clyde Double Drum Electric Car Puller, Capacity
48,750# Max. Starting Pull

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton P&H	50' Span 230 Volt D.C.
5 ton Northern	50' Span 230 Volt D.C.
5 ton Northern	57' Span 220/3/60 A.C.
5 ton Cleveland	90' Span 230 Volt D.C.
7 1/2 ton P&H	65' Span 440/3/60 A.C.
10 ton Niles	53' Span 230 Volt D.C.
10 ton P&H	90' Span 230 Volt D.C.
15 ton P&H	80' Span 230 Volt D.C.
15 ton P&H	75' Span 230 Volt D.C.
20 ton P&H	60' Span 230 Volt D.C.
20 ton P&H	80' Span 230 Volt D.C.
30 ton Toledo	75' Span 550/3/60 A.C.
30 ton Shaw	60' Span 230 Volt D.C.
120 ton Whiting	50' Span 220/3/60 A.C.

DIEING MACHINE

25 ton Henry & Wright, 1 1/2" Stroke, Double Roll
Feed, Scrap Shear

DRAW BENCHES

50,000# Standard Double Draw, 48' Length of Draw
150,000# Standard Double Draw, 28' Length of Draw

FORGING MACHINES

1" to 5" Anco, Ajax, National
4" to 1 1/2" National High Duty, Air Clutch

FURNACES

Lee Wilson National Gas Annealing Furnace, Work
Dimensions 42" coil, 96" Piling Height
Westinghouse Bell Type Furnace, Gas Fired, Charge
Space 38" Dia. x 45" deep

THERMOMETER INDUCTION HEATER MODEL 1400

15 ton Harault Top Charge, With Transformer

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STEAM FORGING—500 lb. to 25,000 lb.

310 BORER

230 Knight Jig Borer, Complete—Now 1950

LEVELERS—ROLLER

52" McKay 17 Rolls 3 1/2" Dia.
60" Acton Standard 17 Rolls 4 1/4" Dia.
72" McKay 15 Rolls 1 1/2" Dia.

PRESS—HYDRAULIC

350 ton RD Wood Hydr. Joggling Press
500 ton HPM Fastverse Press, 24" Stroke Press-
ing Area 36"x36", Max. Daylight 45"
1200 ton Birdshore 4-Column, 20" Stroke Dist. Bet.
Columns 30" x 36", Daylight 42"

1257 ton Baldwin Southwork Forging Press, 30" Stroke
Main Ram, 54" x 41" Bet. Columns

2045 ton Birdshore, 4-Columns, 14" Stroke Platen
60" x 48", Daylight 42"

4500 ton B-L-H Hydr. Forging Press

PUNCH & SHEAR COMBINATIONS

Style EF Cleveland, 30" Throat, Punch 1 1/2" thru 1"

Style W Cleveland Single End, 48" Throat, 8 1/2" Ton

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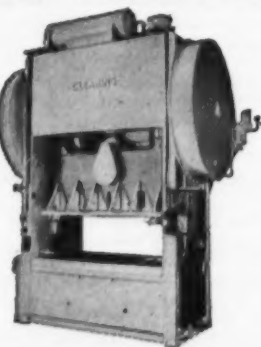
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1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, George T. Hook, Chestnut and 56th Streets, Philadelphia 39, Pa.

Editor, George F. Sullivan, Chestnut and 56th Streets, Philadelphia 39, Pa.

Managing Editor, Eugene C. Beaudet, Chestnut and 56th Streets, Philadelphia 39, Pa.

Business Manager, None.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

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Holders of more than 1 per cent of the capital stock outstanding of Chilton Company: Mary M. Acton, 260 Sycamore Avenue, Merion Station, Pa.; Mrs. Beulah Fahrendorf, Chateaux Lafayette, Scarsdale, New York; Dorothy R. Johnson, 1115 Fifth Avenue, New York, N. Y.; Estate of Mabel M. Musselman, 260 Sycamore Avenue, Merion Station, Pa. Beneficiaries: Mary M. Acton and David Acton; J. Howard Pew, 1608 Walnut Street, Philadelphia, Pa.; J. N. Pew, Jr., 1608 Walnut Street, Philadelphia, Pa.; Mabel P. Myrin, 1608 Walnut Street, Philadelphia, Pa.; Mary Ethel Pew, 1608 Walnut Street, Philadelphia, Pa.; Trademans Land Title Bank & Trust Company, 100 S. Broad Street, Philadelphia, Pa.; Trustee Estate of James Artman, Deceased. Beneficiaries: Franklin Artman, Vera Walters, Alvin C. Artman, Elizabeth J. Artman, Marion A. Pratt, George H. Pratt, by assignment, Edwin Moll, by assignment, Albert C. Sly, Executrix U/W of Frederick R. Sly, Deceased, 149-40 35th Avenue, Flushing, Long Island, N. Y. Beneficiaries: Albert C. Sly, Albert C. Sly and John E. Sly; Mary M. Acton and John Blair Moffett, Trustees U/W of Clarence A. Musselman, Deceased, 1608 Walnut Street, Philadelphia, Pa. Beneficiaries: Mary M. Acton and David Acton; Charlotte M. Terhune, 160 E. 48th Street, New York.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semi-weekly, and triweekly newspapers only.) 28,766.

GEORGE T. HOOK, Publisher

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[Seal]

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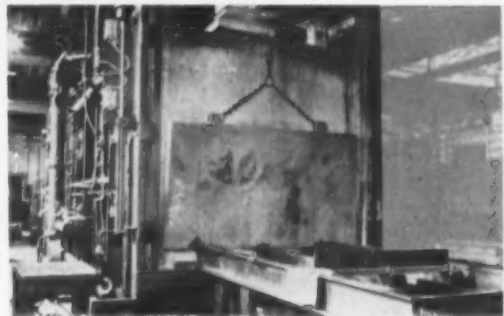
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1	500	G.E.	MT-413	2300	580
1	500	Whas.	'W	2300	550
1	500	G.E.	M-549Z	2200	1180
1	400	G.E.	LE-17D	2200	885
1	400	Whas.	CW-960A	440	1170
1	400	Whas.	CW	440	511
1	400	Whas.	CW-1210	2200	485
1	350	G.E.	MT-442Y	2300/4000	325
1	350	G.E.	IM-17A	440/2200	750
1	250	G.E.	MT-424Y	4400	327
1	250	G.E.	MT-559B	2300	1800
1	250	Al. Ch.	3Q	550	600
1	200	Cr. Wb.	3QB	440	600
1	200	G.E.	CW	440	330
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1	125	Al. Ch.		440	770
1	100	G.E.	IM-18	2200	435
1	100	G.E.	IM	440	600
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1	600	G.E.	K-6345-B	2300	1185
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1	400	G.E.	TE-13B	2300	1185
1	400	G.E.	TE	2300	500
1	200	G.E.	IK-17	440	580
1	200	G.E.	KT-557	440	1800
1	150/75	G.E.	'W	440/900/450	
1	150	Whas.	CR-856B	440	690
1	150	Whas.	CR	440	580
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1	100	Whas.	CR-875C-TEPC	440	710

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1	1750	G.E.	ATJ	2300	800
1	785	G.E.	ATT	2300/12000	600
1	600	Idem	RM	2300/4100	1800
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1	450	Whas.		2200	435
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Care The Iron Age, Chestnut & 56th Sts.
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ADVERTISERS IN THIS ISSUE

An asterisk (*) beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturers for your copies today.

A	
AAA Mchry. & Equip. Co.	181
Ace Mchry. Co.	182
Airtex Products Inc.	183
Ajax Electrothermic Corp.	4
Ajax Engineering Corp.	71
Alan Wood Steel Co.	84
*Alomite Div. Stewart Warner Corp.	133
*Alliegheny Ludlum Steel Corp.	48
Allis-Chalmers Mfg. Co.	40
Aluminun Limited Sales, Inc.	21
American Brass Co., The	141
*American Chemical Paint Co.	72
*American Gas & Electric Co.	38
American Monorail Co., The	33
American Society of Tool Engineers	151
*American Steel Foundries, King Machine Tool Div.	119
American Steel & Wire Div., United States Steel Corp.	36, 37
Ames, O. Co.	180
*Arma Steel Corp.	6
Armel, James P.	183
Armstrong Bros. Tool Co.	185
Associated Spring Corp.	95
Atlas Car & Mfg. Co., The	143
B	
*Baldwin-Lima-Hamilton Corp.	45
Barnes, Wallace Co., Div., Associated Spring Corp.	95
Barnes-Gibson-Raymond, Inc., Div., Associated Spring Corp.	95
*Bellows Co., The	39
Belyea Co., Inc.	182
Bankart Steel & Supply Co.	184
Bennett Machinery Co.	180
Bethlehem Steel Co.	1
*Blanchard Machine Company, The	146
Blaw-Knox Co., Machinery Division	93
Boston Metals Co., The	183
Bound Brook Oil-Less Bearing Co.	115
Bristol Brass Corp., The	52
Browning, Hazard, Machine Tools, Inc.	180
Browning, Victor R. & Co., Inc.	185
*Buffalo Forge Co.	175
Bullard Co., The	8
C	
Canton Drop Forging & Mfg. Co., The	185
Carborundum Co., Abrasive Div.	17
*Chandler Products Corp.	138
Chicago Rawhide Manufacturing Co.	98
Chicago Wheel & Manufacturing Co.	80
*Clemson Bros. Inc.	11
*Cleveland Tramrail Division, The Cleveland Crane & Eng. Co.	173
Cold Metal Products Co., The	58
Columbia-Genova Steel Div., United States Steel Corp.	36, 37
Columbia Tool Steel Co.	136
Consolidated Railway Equipment Co.	183
D	
*Continental Industrial Engineers Inc.	134
Copperweld Steel Co., The Inside Front Cover	
Crawford, F. H. & Co., Inc.	182
Cromwell Paper Co.	41
Crucible Steel Co., of America.	49
Cutler-Hammer, Inc.	Back Cover
E	
*Eaton Corporation	142
Danison Engineering Co., The	54
*Detroit Power Screwdriver Co.	130
Detroit Stamping Co.	92
*Diamond Manufacturing Co.	174
Diamond Sand Blast Inc.	181
Dodge Manufacturing Corp.	51
Donahue Steel Products Co.	180
Dony, D. E. Machinery Co.	180
Dreis & Krump Mfg. Co.	185
Dunbar Bros. Co., Div., Associated Spring Corp.	95
Duriron Company Inc., The	180
F	
Eastern Machine Screw Corp., The	185
Eastern Machinery Co., The	179
Electric Equipment Co.	181
Electro Manganese Corporation.	150
Equipment Corp. of America	182
*Erie Foundry Co.	55
Espen-Lucas Machine Works, The	174
Exide Industrial Division, The Electric Storage Battery Co.	46
Ex-Cell-O Corporation	154
G	
Falk Machinery Co.	181
Fellows Gear Shaper Co., The 26, 27	
Fort Pitt Bridge Works	117
Foster, Frank B. Inc.	182
Frank, M. K.	183
*Freeway Washer & Stamping Co.	177
H	
Gates Rubber Co.	44
*General Services Administration	149
General Electric Co., Apparatus Dept.	17, 18, 19, 22, 23
Gibson, Wm. D. Co., Div., Associated Spring Corp.	95
Goodman Electric Machinery Co.	183
Goodyear Tire & Rubber Co.	10
Goss & DeLessew Machine Co.	174
Gray Iron Founders' Society, Inc.	50
Great Lakes Steel Corp.	75
Griffin Manufacturing Co.	186
I	
Henry, A. T. & Company, Inc.	179
Hafmann, A. Jay Co.	183
Hughes, Arnold Co.	183, 184
Hyatt Bearings Div. General Motors Corp.	32
Hyman, Joseph & Sons	179

(Continued on Page 186)



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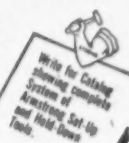
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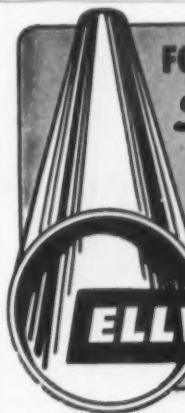
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ADVERTISERS IN THIS ISSUE

(Continued from Page 185)

I		R	
*International Nickel Co., Inc., The	171	Raymond Manufacturing Co. Div., Associated Spring Corp.	95
Iron & Steel Products, Inc.	178	Reliance Electric & Engineering Co.	120
Ivins, Ellwood Steel Tube Wks. Inc.	185	Republic Machinery Co.	179
*Jones & Lamson Machine Co., Machine Tool Div.	24, 25	*Republic Steel Corp. 30, 31, 42, 43	
J		Robinson Export Import Corp. ..	183
Jones & Laughlin Steel Corp. ..	66	Roebing's, John A. Sons Corp. Between Pages 88, 89	
K		Russell, Burdall & Ward Bolt & Nut Co.	77
Kaplan, M. S. Company	161	Ryerson, Jos. T. & Son, Inc.	56
Kasle Steel Corp.	183	S	
*Kaydon Engineering Corp., The	123	SKF Industries, Inc.	16
*Kearney & Trecker Corp.	127	Sesco Inc.	153
Kemp, C. M. Mfg. Co., The	78	Service Steel Div., Van Pelt Corp.	174
Kilde, Walter & Co., Inc.	13	Sessions, J. H. & Son	150
*Kinnear Manufacturing Co., The	140	*Silent Hoist & Crane Co.	153
L		Simmons Machine Tool Corp.	150
*L & J Press Corp.	152	Socony Mobil Oil Co., Inc.	12
Land, L. J., Inc.	182	*Spincraft Incorporated	125
*Lendis Machine Co. Inc.	14, 15	*Standard Pressed Steel Co.	34
Lang Machinery Co.	179	Standard Steel Works Div., The	
Lansing Stamping Co.	116	Baldwin-Lima-Hamilton Corp.	46
Leland-Gifford Co.	174	Steel Shot Producers Inc.	136
*Link-Belt Co.	137	Stone, R. J.	183
Loeb, H. & Sons	182	T	
Luria Bros. & Co. Inc.	159	Tennessee Coal & Iron Div., United States Steel Corp.	36, 37
M		Thomas Machine Manufacturing Co.	53
MacCabe, T. B. Co.	181	Timken Roller Bearing Co., The ..	129
Makepeace, D. E. Company	177	Townsend Company, The	131
*Manco Mfg. Co.	126	*Trabon Engineering Corp. Inside Back Cover	
*Manheim Mfg. & Belting Co.	88	Tractor & Equipment Co.	183
Mannesmann-Meer Engineering & Construction Co.	139	U	
*Manning, Maxwell & Moore, Inc.	94	U. S. Rubber Co. Naugatuck Chemical Div.	90
Meta Machine Co.	96, 97	United States Steel Export Co. 36, 37	
Metal Blast, Inc.	144	United States Steel Corp.	36, 37
Metal Carbides Corp.	174	Universal Machinery & Equip. Co.	181
Miles Machinery Co.	180	V	
Mississippi Valley Equipment Co.	181	Vaughn Machinery Co., The.	5
*Monsanto Chemical Co., Organic Chemicals Div.	47	W	
Morgan Construction Co. Between Pages 72, 73		Wagner Electric Corp. Between Pages 88, 89	
Morrison Railway Supply Co.	183	Wallack Bros.	184
*Mundt, Chas. & Sons	177	Wean Engineering Co., Inc., The Front Cover	
N		Weiss Steel Co., Inc.	184
National Broach & Machine Co. 35		*Westinghouse Electric Corp. 28, 29	
National Carbide Co.	181	Wheeler, C. H. Manufacturing Co.	183
National Machinery Exchange ...	179	Wheland Co., The	116
National Steel Corp.	75	Wilkins, Alwin FR, Inc.	174
*Naugatuck Chemical Div., of U. S. Rubber Co.	90	Willson Products, Inc.	118
*Niagara Blower Co.	124	Wyandotte Chemicals Corp.	169
Nicholson File Co. Between Pages 48, 49		Y	
*Northern Engineering Works ...	120	Youngstown Sheet & Tube Co., The	20
Norton Company	82	CLASSIFIED SECTION	
O		Business Opportunities	184
*O'Neil-Irwin Mfg. Co.	9	Clearing House	178-183
Ornits Equipment Corp.	183	Contract Manufacturing Appears in first and third issue of each month. See Sept. 15 & Oct. 6	
P		Employment Exchange	184
Perkins Machine & Gear Co.	132	Equipment & Materials Wanted 184	
*Philadelphia Tramrail Company	186		
Pittsburgh Crushed Steel Co. ...	136		
*Polyten Products Department of the Kendall Co.	135		
Pope Machinery Corp.	148		
*Portage Machine Co., The Between Pages 72, 73			
Purdy Company, The	183		



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